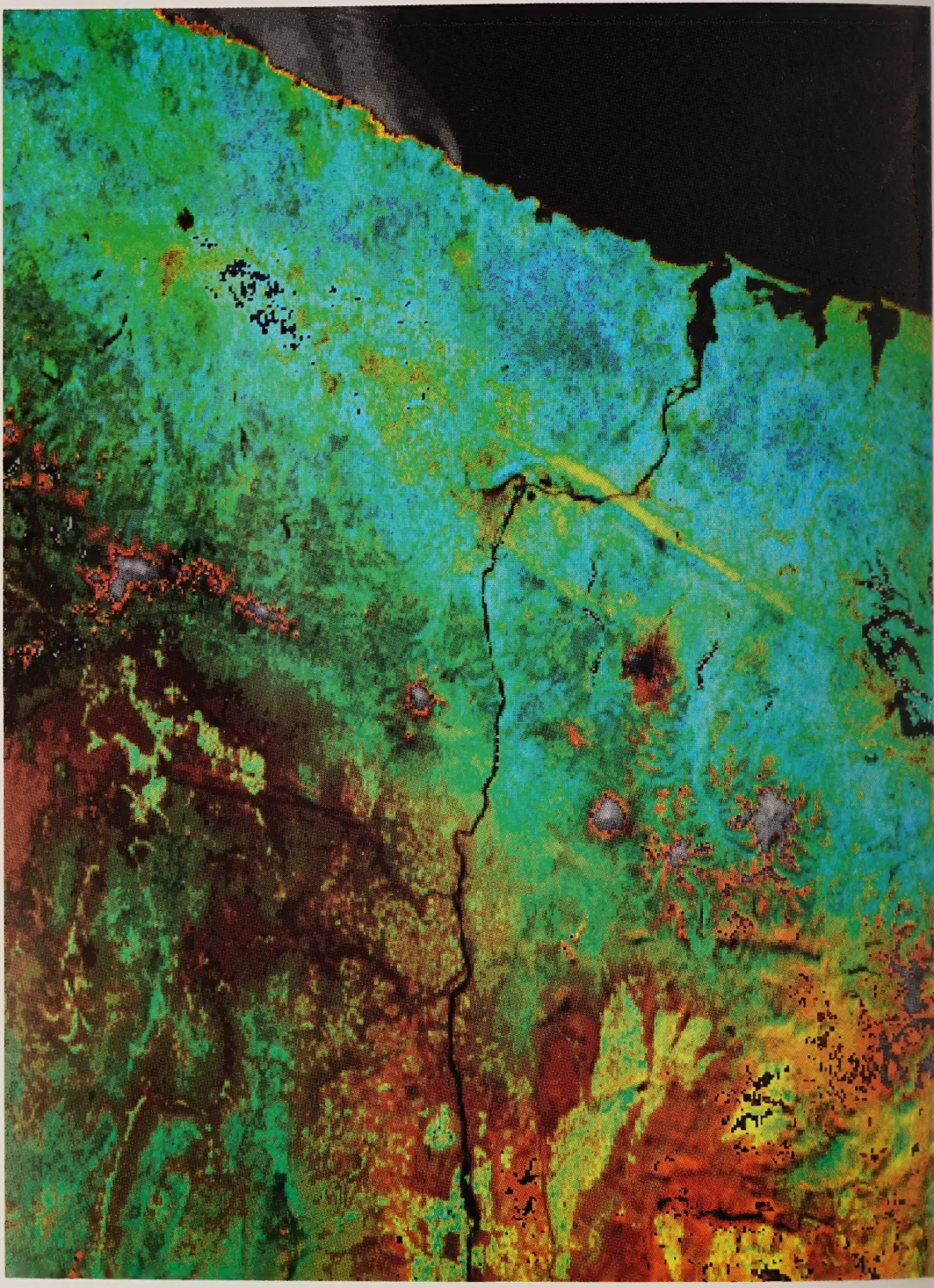
REMOTE IMAGING GROUP

32

JOURNAL NO.32 MARCH 1993



MARCH 1993

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Front Cover: Les Currington's Pyramidal L-Band Horn Antenna.
Inside Front Cover: Origon, USA. False colour image to show different vegetation.
Centre Pages: Four images from the Amateur satellites UoSAT-5 and KITSAT1, reproduced by kind permission of Marc Zouquet, University of Surrey, Guildford.
The two MET4 images relate to Peter Wakelin's article.
The full size picture of the UK and France from Marciano Righini, I4MY, NOAA10 ascending, HRPT Ch2 image, 12 June 1992, 1749-1804 UTC.

REMOTE IMAGING GROUP.....OFFICERS 1992

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FROM THE EDITOR'S DESK

JAMES BROWN

I am reliably informed by our membership secretary that our journal is now sent out to nearly thirty countries. Almost a global monitoring system in itself! I would suggest that this figure is a good indicator of the value of our group on a world-wide level, and also an appreciation of the worth of our contributors. That is not to be self-congratulatory, but simply to acknowledge our debt to the pioneers, and entrepreneurs alike. It also concedes that improvements have been necessary, and I hope we will continually strive for excellence. But it also means that if standards have been raised, then we need to uphold them if we are to continue to be a serious yet broadly-based publication. With that in mind, whilst we stand firmly by the principle of free speech, and will continue to publish letters which take reasonable and reasoned issue with the establishment and manufacturers alike, we do not feel it is in our best interests to give endless pages to those who want to generate more heat than light! It is good for us all to be kept in touch with the thinking of our membership, and for constant appraisal to take place, and an over sensitivity to criticism at this point would be entirely wrong. But the primary aim of our letters page must continue to be the help and instruction by one another in the glorious subject of remote imaging! For that reason despite the editorial guidance last time, several correspondents wanting to keep the pot boiling have unfortunately met with the blue pencil!

In this issue it is not so much the case of taking the bull by the horns, but of taking the horn by Les Currington. Could this be the beginning of a new spate of amateur aerial construction akin to the famous 'Henry' Yagi? - Will 'Les Horns' be RIG's answer to the EC? Watch this space! Also worth mentioning, courtesy of the University of Surrey, is the improvements in amateur satellite remote imaging, there for us all to see, and we hope to keep a watching brief on this area.

Manufacturers enhancements feature again, and we hope in the future to bring you some professional comparative assessments of receivers, together with yet more reviews, and what to look for in a well designed LNA. It is good to see that the RIG conference is up and running, and has been heavily booked. Already an international event, and although not cheap, we hope it will be excellent value for money. Full report in a future edition.

What do you do when your mother board dies and you've a week before you go to press? Well, this editor picked up the phone to the company from which the board had come, and within a couple of days, without waiting for the old board to be returned, the new one was in and working. That kind of help deserves publicity, so the gold star award of the month goes to 'Puters' of Bromley, Kent for their superb service. See the computer press if you want to contact them.

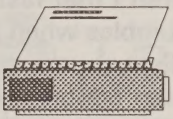
Finally, it looks like being another record breaking season as far as our UK weather is concerned. Depressions of 916 millibars, the wettest January on record, whilst on the other side of the world my paper recorded the rarity of week after week of sub-zero temperatures for Vancouver. Global warming? Cyclic patterns? Who knows, but somewhere there's a satellite that can help us find some answers to those questions, and what an amazing thing that we should have the free access to so much of that data, Long may it continue!

Whilst recognising the preponderence of PC based matters in the journal, due largely to the high percentage of PC users, the committee would nonetheless like to ensure that other computer users are adequately catered for as well. Although no helpful contributions have been refused thus far, it is likely that in the future a regular column will be established in order to actively encourage the publishing of up to date news of products and their enhancements as they affect these other users. We hope to find a regular 'columnist' for this new section, but in the meantime authors should send their contributions to the editor as usual. It ought perhaps to be stressed that the contents should be of relevant subject matter.
[The Committee]

STOP PRESS...
A new computer program for the PC has just arrived. It is called NEOPAINT, and is without doubt the best Shareware editing program I have seen for GIF, TIFF and PCX file formats. It can also add text in many fonts and sizes. It is a GUI (Graphics User Interface) program, mouse operated; and also contains a screen grabber section. More details in next issue. Available from the GIF Library on Disk 99C and the RIG BBS. *Mike Goodall.*

FROM THE MAKE-UP EDITOR'S KEYBOARD

MIKE GOODALL



The GIF Library is still proving very popular, but the disk drives I use on my machine are getting (to put it bluntly) a little knackered, due to all the copies that I do! With this in mind, I have decided to increase the donation, when requiring copies of GIF and Shareware disks to £2.00 per set. I feel that this is well below other distributors charges. (Some charge up to £3.50 per disk for Shareware these days.) This will enable me to replace the drives before they fail completely.

Now on a brighter note, and still with reference to the GIF Library; I am occasionally asked if we can supply GIF images and Shareware for members with Computers other than PCs. I understand that some machines can run PC Emulators, and use some PC shareware and GIF pics with no problems. The Archimedes is able to do this, and Les Hamilton has converted the PC GIF Library disks to Arc format and has agreed to operate the Archimedes Picture Library. (See his article following the GIF Library page.) However, for people with Amiga's, etc. some other sort of conversion process is needed. Alf Jander has managed to convert some pics from the Amiga format, and we hope to get the details from him, but if anyone else knows how to convert other formats, and would be prepared to convert and copy disks for members using the same computers as their own, I would be pleased to supply a set of the Library disks for them. Please contact me direct.

As you saw from the Rig Shop Corner in RIG31, Henry obtained some large dishes at very advantageous prices. As I experiment quite a bit with various satellite systems, including the WEFAX ones, this was an opportunity not to be missed! However there was a problem. How does one collect a 1.8M dish (that's 6ft for us oldies!) if you haven't a truck or a lorry. Another Radio Amateur, G3PWK, a local friend for many a year, came to my aid. He had a roof rack with two ladders strapped to it. A normal roof rack won't work very well, as the dish would hang over front and back as well as the sides. The ladders gave sufficient support and the dishes were duly lashed down with around 50ft of rope and some very sticky carpet tape to stop them sliding. The comments from the other members of the Radio Club were quite amusing. It was pointed out that we were the only car to be protected from the ensuing meteor shower, as the Peugeot looked just like an overgrown tortoise! A suggestion was made that as Diesel Peugeots

aren't that fast anyway, so it may as well look like a tortoise! Despite a few rumbles when a lorry passed us, the homeward journey was uneventful. The dishes were surrepticiously unloaded, after 10.00pm, and luckily the wife was upstairs watching the TV. So far, so good. They were hidden in the garage overnight and moved to the back garden early in the morning, before my wife arose. Surprisingly, there was no eruption! Only a wry comment about the giant woks, and would I give her plenty of notice before the 1000 Chinese RIG members were invited for dinner! The 1.26M dish is relatively easy to handle, and not too difficult to make a mount for. A 1.6M dish can be manhandled, just; but the 1.8M is a brute. How one makes a solid mount for this is yet to be discovered (never mind the width, feel the gain!) Incidentally, the formula for working out the focal point of a parabolic dish is fairly simple...

(RADIUS (half the diameter) SQUARED) - divided by - (DEPTH x4)

Thus a 1.2M (120cm) dish with a depth of 12.5cm would have a focal point of 72cm. from the centre. This is approximate; the real focal point could be a centimetre or so, either way. If you wet the dish, focus the Sun's rays on a piece of card, and measure the distance when the spot is smallest and brightest, this will give the most accurate results.

Back to the Journal, as it is now called...

The future deadlines are as follows...

Cover date of Issue	*Deadline for Copy*
JUNE 1993	25TH APRIL 1993
SEPTEMBER 1993	25TH JULY 1993
DECEMBER 1993	25TH OCTOBER 1993
MARCH 1994	25TH JANUARY 1994

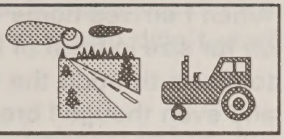
Advertisers copy will be required 7 days earlier than the deadline date, and should be sent direct to Mark Clarke. Late ads will not be included.
These dates will be rigidly adhered to and there will be **NO** exceptions.

Also, remember that Members Private Advertisements are *FREE!* If you have any RIG-related equipment for sale, send in the details to James.

PLEASE REMEMBER... SEND ALL COPY FOR ARTICLES, READER'S LETTERS, ETC. DIRECT TO JAMES BROWN.
I only deal with the RIG GIF Library on a direct basis. ***I can only accept calls about the GIF Library from 2 till 4 in the afternoon.*** *For all enquiries regarding GIF viewing programs and suitability for your specific computer, contact the appropriate member listed on the Helpline page.*

CHAIRMAN'S WAFFLE

HENRY NEALE



You must have had a good Christmas. I certainly have felt the strain. When you got your mitts on the last Newsletter, the orders came pouring in. It didn't end on the 25th either - orders were still coming in the post until the middle of January. It has eased up recently, but I had great difficulty getting fresh stock in to replace that sold! Even Timestep were not expecting so big a run on most of their products.

I ran out of most of the Dartcom products as well, and the poor LNA kits were left out in the cold. They take a fair while to make up and they got left till I had more time. I now have all the components and by the time you read this the back-orders should have been processed.

The treasurer was very busy at his factory and the additional RIG work left him with rather a large backlog. It is hoped to have the 1992 accounts available for the AGM at Sandown - 6th March, but that will be pushing it. I am sorry that we were not able to give you more warning but it is very early this year and beyond our control. We didn't intend to double turn-over again this year but we appear to have done so. This is becoming much more than the hobby supply centre that we started with. It will soon be a fully fledged mail order establishment. In view of all this, may I offer my apologies to those of you with orders that weren't quickly dealt with, but I am nearly back to normal now.

It has come to our attention that we have not been charging enough for certain items. This is because of an incorrect estimate of postage. Some of these have now been reviewed and corrected unfortunately upwards, so we don't make quite so many losses. While on the subject of Shop corner, many do not specify which size of disk is required. I usually send the type that I have most of, but please don't expect me to read your minds.

Occasionally I have been known to scale great heights and view the scenery or something, so when I saw a safety belt, the type that BT engineers use at the top of poles, at the local emporium Henry thought that it might be a wise investment. It wasn't expensive but it was old, 2" wide and 1/4" thick leather.

When I arrived home with all my goodies I left it until last, but then tried it on for size in front of my wife. That was a big mistake! It had twin tongues to insert through the leather but Henry was not as small as he used to be and even though I breathed in it would only just go into the first holes. That was live-able with but when it came to try and undo it I thought I would need the Fire Brigade!

My wife made some rather painful remarks about my midriff and couldn't I breathe in - well I was nearly going purple and just couldn't find another way. Those twin tongues just had a mind of their own - they were bent to stop it coming undone accidentally and almost did Henry a nasty injury! Eventually I managed to insert a screwdriver between the buckle and these tongues and with my wife's help managed to prise them open. I sighed a very long sigh of relief and will have to seriously consider the consequences before trying that one again. Well it was 3 weeks after Christmas and how many of you can say that your midriff wasn't slightly larger than it was before?

We are all subject to the process of ageing and some days I certainly feel it. Even my ole car is getting the worse for wear - its been round the clock and has now totalled 172,000 miles, and more than I would like to admit have been on RIG business. It did have a new set of piston rings and big-end shells about a year ago as a thank you present but it is getting so worn out that the upholstery is thread-bare - a certain spring is now becoming attached to my anatomy on a few occasions. I have a spare one (seat) which I obtained from a local breaker but it needs a little bit of welding done on it before I can use it. One day I will get around to it.

Some of you know that the Electronic Bulletin Board has Kepler elements on it, and that they are normally updated late on a Friday night. This is not always the case, and I have now inserted an extra bit in one of the opening pages that indicate when the next update is likely. If this is about a week away then they have been updated but if the date is close then wait until it has changed.

Mentioning change has reminded me that our Group has changed since it's inception. In the early days most members were dedicated technicians, furthering their hobby (often referred to by close family as a consuming passion).

We supplied Framestore boards, receivers and preamps. In those days you needed technical knowledge, devotion, and hours upon hours of time. To

embark upon the construction of a Framestore was the equivalent of a Lands End to John O'Groats walk! It was something that you didn't start unless you felt confident about in the first place.

We are now able to service more of your requirements than ever before, but the technical ability of Group members has declined in a similar manner to that of the Amateur Radio fraternity with regard to the black box approach.

There is nothing wrong in buying Black Boxes but techniques cannot be bought and have to be learned. Just because you buy a car, it doesn't mean that you can drive it competently.

On many occasions I find that goods have been returned and you expect us to refund your money just because its the second Tuesday in Whit week.

If you cannot get our products to work, or they do not seem to do what they are supposed to do - then write to me or ring me first. I will try and sort the problem out, especially if it is a simple problem.

Goods have been returned when it is obvious that every thing on the units have been twiddled, or even reverse volts applied! "No it wasn't me Guv." has been said to me many times, and frankly when the fault is analyzed, the reverse is true.

Proscan receivers scan, but won't lock onto anything even if there is a signal. These are typical symptoms of a reverse voltage application. We hope that the inclusion of a series diode shortly will stop this problem.

ProSatII has 3 pots that the operator may adjust; but there is another one in the middle of the board, and "it won't lock to the incoming signal" usually means that the phase lock loop pot has been twiddled. The instructions indicate the pots which you may adjust, but you seem to be going twiddling mad recently.

We like to have happy customers and I think that every problem has been ironed out to date, but please give us the chance to work on it first!

The RIG Week-end has been organised for the 21 - 22 - 23rd of May, near Daventry. Dave has had many replies to the slip that was included in the last Newsletter. Just about all of them were for the full residential week-end with just the odd day visitor. Bookings have now been made that reflect this and it is now residents only. There is just too much at stake to be over

enthusiastic - we don't want a failure upon our hands. If this is the success that we anticipate we can then perhaps go on to bigger and better things in the future.

I must say that I was surprised that there weren't more interested in being just day visitors but perhaps we can cater for that side on a future occasion.

We have indicated that we would like to have a receiver review done of the currently available models. I have yet to get this organised, and can only excuse myself with the facts of the extraordinary transactions that took place after the last Newsletter was posted.

One membership renewal was received by Ray on the following Tuesday, which was before the posting was completed. I know that some of you are quick off the mark but that is remarkable.

The use of the term "Newsletter" will invoke some feeling because it has been agreed to change it to "Journal". It's content will not change and is more in keeping with a more modern image. My wife only wishes that a little would rub off on me!

In the last Newsletter I said that we had some crystal filters available. We were hoping to get the details together and supply a pack of information and advice. Before I go any further, note that these filters will not cure everything - only specific complaints.

They will not affect cross modulation, intermods, overload, or any other problems after they have been generated in your receiver. They will do a good job in the intermediate frequency of a correctly designed receiver. If everything is OK in the RF stage and the Mixer stage, and there aren't any linearity problems, they might then do a good job.

They have a +/- 18 Khz bandwidth and a stop band attenuation of over 100 db, but they have to be matched in properly. The mixer output circuit is normally a L/C tuned circuit at 10.7Mhz which needs to be damped down with a 2K7 resistor across it. The signal can then be taken directly from the drain (via a 1n capacitor to decouple it) to the input of the filter. On the output side a 2K7 and a 25pf in parallel to ground completes the matching.

The signal can then be taken directly from the filter into a high impedance circuit such as a FET stage and does not need to be decoupled because the FET gate circuit is already at ground potential. We were going to sell these

at £5, but because we have not completed the paperwork we are letting them go at present for only £4.

As if Henry didn't need anything else to do; he has started to build Feedhorns for dishes. There is some debate as to the correct length of the quarter wave probe. Some commercial designs use 35mm but Henry thinks that this should be 44mm.

I will be doing some tests in the next few days to try and sort that one out. In the meantime I will try and finish some of the jobs that are already started but uncompleted.

Best wishes and I hope to see some of you at this year's Rallies.
Henry.

METEOSAT STOP PRESS....

As we go to press we have news from Meteosat Mission Control of several important developments in the next few months. We are grateful to Peter Wakelin for advising us of the details.

METEOSAT 3 begins a westward drift on January 27th. Currently at 50 deg. west, it will be stationed at 75 deg. west by February 19th., and will be on station there for the foreseeable future. At the same time the one remaining fully operational American geostationary satellite, GOES-7 will be drifted to 135 deg. west. During this time the normal schedule of imagery will be maintained, and control of the satellite will remain with ESOC, who will be using land lines and the facility at Wallops Island to link up with the control centre at Darmstadt. To save everyone doing the calculations, those of us in the south west of the UK may just about continue to receive APT transmissions, with an azimuth of 255 deg and an elevation of about just 3 deg.! Those in east Anglia will be at 0 deg elevation, so are unlikely to be within the reception footprint. Sad news for many of those who currently directly tune in to the ADC of this satellite.
However, it is also intended to increase the number of ADC 'L' format transmissions via METEOSAT 4, and there may be up to twice as many, with images probably being transmitted every 90 minutes.

METEOSAT 6 is on course for launch in late 1993.

Of even greater interest is the intention to begin relay transmissions of the Japanese GMS satellite in late April or early May. Whether these will be fitted into an already crowded schedule, or whether METEOSAT 5 will provide a relay facility is uncertain.

FROM THE SECRETARY

JOHN TELLICK

Registration and Interference...

As some members already know, at last year's review of frequency allocations, WARC 92, part of the 137MHz band was made available to low earth orbiting LEO satellites not involved in meteorological services.

Letters were circulated by EUMETSAT, The Met Office and the World Meteorological Organisation requesting all APT user stations to register with their national PTT's in order to, in turn, be placed on the Master International Frequency Register of the International Frequency Registration Board with a view to safeguarding frequency allocation to the Meteorological Satellite Service, and obtaining protection against possible harmful interference from new radio communication services.

I have been corresponding with EUMETSAT, The Met Office, the WMO and the DTI for some months now, but have received little information back. The DTI have now informed me that registration of APT stations in the UK is not required by the DTI, and therefore they will not register us. I can tell you that they were not amused when I telephoned to say that I wished to register some 1,000 odd UK APT stations!

The DTI have said that they will protect the 137MHz band, as far as the UK is concerned, against allocations other than those specified in the UK Table of Frequency Allocations.

I have been promised a statement from the DTI regarding this matter for publication in the next RIG Journal.

Regarding interference to the 137MHz band, the DTI appear concerned that we are suffering Pager interference, and would like more details. I really need to get some idea of any increase in interference, and to which areas this applies.

Would those of you, in the UK, who think interference has become worse in the last year, please give me a call, or drop me a line, informing me of the receiver and antenna used, and the frequencies affected. Also let me know if you have changed receivers and have obtained any improvement.

RIG RESIDENTIAL CONFERENCE

Dave Cawley

Response to the fall out slip in RIG 31 has been amazing. We wondered wether we would even get 50 people to come along and spend a weekend learning about most aspects of satellite imagery and receiving techniques. Imagine our surprise when we got over 110 returns!

Promising to be the first ever conference of it's type, it will be held at a 4 star hotel in Daventry, Northamptonshire, just a few miles off the M1. All the rooms are double size for single occupation, and have everything from a trouser press, remote colour TV, to direct dial phones; everything you would expect in fact.

The lecture theatre will take over 100 people and there is a large area for exhibitors. We expect all RIG advertisers to attend and show their latest equipment. Next to these areas is a very large south facing private terrace, sufficient for everyone's dishes! You will be able to see live demonstrations of APT, HRPT and PDUS.

Computer and receiver experts will be on hand to sort out your niggling problems. Whatever problem or query you have, we may be able to answer it, or maybe even fix it for you!

John DuBois and Jim Bacon have confirmed that they will be coming to talk. John was the first to receive GOES VAS, HRPT and PDUS in the States, and there maybe other satellites he will talk about as well! Jim has been a nationwide TV forecaster and will talk about weather, satellites and more!

This whole weekend, with food, is being subsidised by RIG at a cost of £69.00 inc VAT (VAT receipts available). By now you will have been notified by direct mail; if for any reason you haven't, or want to squeeze in at the last moment (very few spaces left though); then call me now on 0440 820040.

Please note that this is strictly a residential conference. You must be registered to be admitted. Any members simply turning up on the day, for a quick look, will unfortunately be denied access. This is a condition of the Hotel Security.

SATELLITE RADIO PROPAGATION

Simon Lewis GM4PLM

Now I'm no expert on these matters so the following is compiled from various sources and from lots of reading over the past few years.

Introduction

When you sit in your shack decoding APT images or watching METEOSAT pictures roll by, you may be fooled into thinking that the signals transmitted from these birds are perfect. But are they? Apart from the problems introduced by receivers and antennas, there are other problems introduced by more 'natural' sources!

So what are they and how do they affect our ground stations? The following gives some idea of the problems faced and these are only the ones we know about!

The Sun

Nearly all radio propagation is governed by the sun. Yes that large fiery ball at the centre of out solar system is the source of much of our problems.

The sun is a massive nuclear reactor burning billions of tons of material each hour. Some of the products of this reaction is heat and light but it also produces enormous amounts of X-rays and gamma radiation.

The sun as you probably know has an activity cycle of around 11 years. i.e from maximum activity to maximum activity takes approximately 11 years. So what 'activity' is this? Our sun is classed as a G type red dwarf. One feature of these stars is they seems to suffer from spots! These black areas on the face of the sun are cooler areas but they also exhibit a distinct lack of gravitational control. If conditions are right the magnetic field around these areas collapse and millions of tons of material is expelled from the suns surface. The explosions release tremendous amounts of charged particles, as well as high levels of X-ray and gamma radiation. The radiation travels at the speed of light and reaches earth approximately 8 minutes later, whereas the charge particles travel much slower and arrive 36 - 48 hours later.

This event is known as a Solar Flare. It is these uncomprehensible events 8 million miles away that cause so much upset here on earth and for orbiting satellites.

SID's

No, nothing to do with Gas Board sales, Sudden Ionospheric Disturbances (SID's) are caused by the solar flare's radiation. This happens when the radiation penetrates the ionosphere, temporarily ionising the D layer. It halts almost all ionospheric propagation for periods of a few minutes to hours. This usually affects HF propagation only.

However the radiation from the flare has drastic and sometimes devastating results on satellite subsystems. The high radiation levels affect navigation and attitude control systems and can literally knock the satellite out of its correct orbit. The charged particles also have effects on solid state memories, the passage of one particle through a memory gate can alter its state from 0 to 1 and vice-versa so causing a program to crash.

The charged particles that follow a solar flare reach earth some 36 - 48 hours after the event has started. The particles are highly ionised and when they hit the upper atmosphere they can cause extensive auroras and magnetic storms. This blast of charged material also 'stretches' the earths atmosphere as it hits and pushes the atmosphere along with it. In some parts of the orbit the satellite will travel through denser regions of the atmosphere as the thicker layers of atmosphere are pushed further out into space. This increase of density leads to increased drag causing the satellite to slow in orbit, so lowering in altitude. In times of solar maximum, increased solar activity can lead to shorten satellite life spans. Unfortunately this solar activity also has other far reaching consequences for us earth bound individuals.

Scintillation

Signals from space all have to pass through the ionosphere to reach earth. These signals can become phase distorted if the ionosphere is being subjected to solar radiation upsets. This is known as scintillation and is the same effect as the twinkling seen on starlight. This distortion can cause severe fading and distortion even to the extent that signals can become completely unusable. Unfortunately for those of us that live in high latitudes this effect is seen daily as the satellite travels through the active polar regions. Likewise for people who live in equatorial regions they will probably never see this effect.

Sporadic E

The E layer is located about 110 kms above the earths surface. Normally this layer does not propagate VHF/UHF signals, however it can sometime propagate these signals over large distances. The reason for this effect is

not clearly understood, it appears without warning, happening mostly during the summer months and mostly during daylight hours. Sporadic E seems to occur when the E layer suffers a localised area of intense ionisation. The reason for this is unknown and remains somewhat of a mystery. Much research has been done on its effects and predicting where and when it may happen, the resultant arguments and findings would take up a book many times the size of this Journal! However the results on satellite downlinks are devastating. Deep fading and phase distortion are major effects and these usually continue until the satellite is clear of the ionised area.

Microwave Propagation

Although most of the upsets mentioned above affect VHF/UHF signals, microwave signals are also affected. Little research has been made into these effects so not a great deal is known about them. Certainly scintillation does take place at SHF, indeed the 1691 Mhz signals from the METEOSAT platforms are without a doubt affected. Although the geostationary satellites appear to stay in the same position in the sky, the ionosphere between earth and the satellite is constantly moving, hence the reason why all GEOSAT's now use circular polarisation.

So you would assume that microwaves do not tend to suffer as much as VHF/UHF signals from propagation upsets? Wrong! Unfortunately they seem to suffer from a totally different type of propagation upset.

Path Attenuation

Path attenuation at SHF is variable and dependant on a number of factors such as water vapour levels and localised weather.

Attenuation increases with frequency and also with path length, therefore lower angle satellites using SHF (GOES) tend to suffer from higher path attenuation than those using higher angle orbits such as METEOSAT.

Localised weather can also temporarily affect SHF signals. Even at higher microwave frequencies rain and other precipitation can be a major problem. Recently whilst watching 11 GHz signals from the ASTRA satellite the author watched signals literally 'disappear' during a particularly heavy hail/rain storm.

Attenuation at these frequencies can be as much as 0.5 db/Km in heavy rain. Even at 2 Ghz this only drops to 0.3 db/Km which could drop your METEOSAT signal right into the noise for a short period. Luckily localised attenuation of this magnitude is reasonable short lived, although on marginal

systems extended periods of heavy rain could reduce signal levels to the extent that the system is almost unusable.

Ducting

Most of you will be aware of ducting at VHF/UHF but it can also affect SHF systems too. Ducting is caused by a layer of warm air over a cooler surface, either another layer of air or the earths surface, occasionally the opposite happens. Normally this ducting is not intense enough to propagate SHF signals and only in rare circumstances does this take place at SHF. However there is a well documented existence of a North Sea Duct. Stations around the North Sea have reported intense ducting during summer months. After some investigation it seems that low lying stations (up to 30m ASL) are particularly vulnerable. They suffer serious degradation on paths to geostationary satellites at elevations between 10 and 35 degrees.

The only practical solution is to move the station above the ducting layer or further away from the sea, neither very practical. Maybe one of members can comment on these effects?

Ducting is also a problem is Arctic regions but I doubt if many of our members are in a position to comment!

Conclusion

From this article the reader can deduce that the reception of VHF/UHF/SHF signals from satellites is far from perfect. Although luckily the interruption to reception from these effects is only an occasional affair and never usually prolonged.

So next time your APT signal is poor or your WEFAX signal shows a wobble is it really your station at fault or could it be something else? Now where's that solar activity report!

ERRATA... REF: WEFAX MK2 INTERFACE PCB IN RIG29

An error crept into the circuit diagram... The op-amps UI:A and UI:B should be both in the "inverting amplifier configuration, i.e. pin 3 of UI:A is GROUND, as is pin 5 of UI:B, (both pins being the non-inverting inputs).

THE PCB LAYOUT IS CORRECT! *Peter Williamson, VK4AWP*

MEMBERSHIP RENEWAL AND COMMENTS

In the first few weeks about 300 renewals were received. Completion of the questionnaire has been virtually 100%, which is very encouraging, and almost 50% have made comments. Below are some sample comments from the first 150 members: but note that this is not a random selection. ALL the negative remarks received are included, along with some favourable comments (of which there were too many to print).

Iv'e been a member of RIG for about 4 years and in that time the Newsletter has got better and better; it is now a very professionally produced journal, and No.31 with colour I felt was superb. I eagerly await the newsletter dropping on the mat, and read from cover to cover. I always read the Ads.

It would be very helpful to have a listing of members who have Packet Radio.

Very good value for money - though more like a magazine than a newsletter! Does anyone know format of HRPT/PDUS for members who can build their own kit, but do not have c.£500 to spend? (Apart from Timestep, that is.)

Both RIG and the Newsletter provide a truly excellent service.

Excellent for my purposes and especially helpful to the beginner in terms of explanations and exposure to sources of new or secondhand equipment at sometimes special prices. It also appears that RIG may be able to represent members' interests to government/international agencies such as DTI or Eumetsat, in the future. It would be interesting if information could be included about other image sources - is it possible to pick up re-transmitted images from other out-of-range sources; e.g. via HF FAX. I am interested in Far-East weather activity.

Great, and many thanks to Henry for his instant help. Thank you for a super 'magazine'. I believe it to be more than a newsletter.

RIG Newsletter continues to provide help and encouragement - especially 'constructional' items. Like the new 'image' (excuse pun) that the front cover gives RIG. Thanks to all concerned.

Everything fine as it is; I'm sure you are doing it right. Although covered in back issues, a glossary of terms, for new members from time to time?

I'm pleased to see the group go from strength to strength. It's becoming (is already?) very professional; keep it up!

Many thanks to you all for the hard work you put into the group.

Every issue gets better! Can this go on?

The new style Newsletter is excellent. More colour pictures please!!

RIG31 - Best ever! Don't change things, just go with the flow.

RIG is an excellent magazine. Something for everyone. Congratulations to everyone concerned in the compiling of the magazine. Thank you.

Well pleased with RIG and all personnel that makes it work. Thanks.

What a great job has been done to liven up the Newsletter - and in colour too! Well done to all concerned. Picture quality very good.

Excellent value for £9 and proud to be a member.

Very good format now with good mix of articles. Love the colour pics.

The Newsletter, like port, improves with age. Well done to all.

The Committee are too heavily biassed towards PC based systems, for various reasons too lengthy to detail here. As a lone crusader on the Committee to request support for other systems to the same degree as the PC I failed to get any support. I fear mainly because PC systems brought money to the Group, whereas other systems did not, which is regrettable and not in the interests of the current or potential membership.

Excellent publication, could do with some more technical articles; and how about more info on hard copy, e.g. thermal printers? Keep up the good work.

I would like to see more articles on Meteorology and the interpretation of images. Peter Wakelin's articles are a good start.

Congratulations on new style/context RIG Mag/Newsletter. Do you think the occasional note in Newsletter regarding 'Educational activities' - I'm sure it would help those of us who try to interest schools in our activities.

Would like to see more constructional articles, especially for HRPT. Thanks to all for a first class 'Newsletter'?

RIG has been most useful in getting going on Polar orbiters. Newsletter is excellent, especially in the new format. Articles for beginners would be a good idea.

More articles on the Archimedes! (I admit being biased!!)

Well worth £9 a year! I agree with the comments recently regarding the need for a slightly 'lower tech' approach to the subject. I am having some difficulty keeping up with 'PDUS, HRPT, AVHRR, HDS' etc.

Newsletter is good; would it be possible to add the description of the Centre pictures to the bottom of each one, as it used to be.

The line between RIG and Timestep is becoming worryingly blurred.

Have tried several times to use the Bulletin Board. It is quite incomprehensible to me. I thought that having used Prestel, and my banking by computer and modem, things would be just as easy. No such luck - as user friendly as a rat trap.

Regret that as with Ham Radio, we live increasingly in a world of 'black boxes'.

Newsletter excellent. RIG officers contribution excellent. NOT happy about unhealthy close relationship with Timestep. They do a good job, but there is a tendency to squeeze out competitors, if only due to being seen in print too much. Something should be written into constitution as a safeguard. (I intend to purchase from Timestep in the future.)

I have been selected by the Royal Meteorological Society to give a short talk at an international conference on Toronto in July 1992. The Conference is about 'School and Popular Meteorological and Oceanographic Education'. I will be including some ideas concerning Remote Sensing and could provide and article for RIG after the Conference if appropriate.

For my money, RIG31 had just the correct proportion of constructional articles, reviews, letters, facts and ads. Don't change anything - unless we can have more of everything! Thank you for all the work you do on our behalf.

The Newsletter is excellent. Achieves a good balance of technical v. non-technical. Delighted to see a software programming article in RIG31. The publication/membership is excellent value for money.

Far too technical for me. I know nothing about electronics. Can we have more about the weather, interpreting pictures, etc.

Although not a Radio Amateur, I am a member of a number of clubs, RSGB, ISWL, BARTG are some, but the magazine/newsletter I most look forward to receiving and reading is RIG. I am glad to see in the latest issue that an article on another form of Remote Imaging has been produced, amateur CCD. Perhaps this could be enlarged upon, without treading on the toes of AMSAT UK. Perhaps also FAX could be considered? Whatever the direction, be assured of my support and continued membership.

Please remove blatant connection with Timestep and be independent.

I am a new member of RIG (Sept.92) but it's very good. All in the Newsletter is interesting. The RIG shop corner is very nice. The RIG Newsletter is the best newsletter I know just now. Other Ham newsletters often have only a few pages of interest, so I am very happy to be a member of RIG.

I may not write in regarding technical details, etc., but I learn and enjoy from others. I marvel at their expertise and dedication. I wonder how they manage to secure 40 hours out of the average 16 hour day. I admire those who give their time and energy to the large silent, yet hungry, majority out there, who browse with avid interest though the pages of each RIG Newsletter; Many thanks.

Your Newsletter has much information, that is not found here in Germany.

i) Personally I don't use reference orbits. ii) You are becoming a large group now. Please don't let your newsletter get filled up with bureaucracy and politics as 'Oscar News' has. You've got it exactly right, don't change it.

RIG organisation - A member's list - Regional groups/organisation to foster common interests.

My first year in RIG. I feel that it is one of the (if not the) best specialist groups I have ever come across. The support in terms of hardware, software and newsletter are 1st class. Thanks very much.

More about weather and any other uses for the received pictures. More about writing computer software relevant to imaging.

The Newsletter is superb with a good balance of articles. The only complaint is that it only arrives 4 times a year. Bimonthly would be great. That is a compliment. As I am new to RIG I just hope that I will be able to make worthwhile contributions at some point. Keep up the great work; just try to do it more often.

Newsletter - excellent. Don't understand it at all, but am learning fast. It would help to have a Glossary occasionally. RIG - a superb group! Well done to all who work so hard.

Issue 30 about the right balance - shortfalls are limited details (programme elements) of orbits including effects of oblateness, air drag, etc., and now we have the data, where to from here? - Excellent 'Journal' - There is nothing wrong with 'Newsletter' though.

Excellent. I have been impressed by the commitment and enthusiasm of the 'team'. I have also been saddened by the unthinking criticisms by some of your correspondents.

Very many thanks to the Committee and officers for help at various times. I always look forward to receiving the newsletter; always something of interest; and gets better very issue.

Still incredible value for money! Regarding the name of the 'Newsletter' - 'Journal' is a good idea.

[As you can see from the comments above, we appear to have it just about right. We really do appreciate feedback of such a complimentary nature; it makes it all worthwhile. To those who criticise we can only quote the old adage "You can't please all of the people, all of the time!". The question of HRPT/PDUS for a home brew project is interesting, but it is simply too complicated for any but those well experienced in digital techniques and advanced computer programming to seriously consider at present. If you think differently, and could produce a cheap kit for a hardware, software, receiver system, I'm sure there would be interest. With regard to producing a Bi-monthly publication; the lead-in times required by the printers, coupled with getting in copy in time, and extra cost of postage, production, etc. would make it impractical. The Archimedes users have a new Picture Library service, and a Glossary for beginners is also included in this issue. Mike]

A few secrets for PROsatII users from the Timestep team...

ALT X - All current programs respond to the ALT X command. This saves a PCX file that can be imported directly in Windows Paintbrush and many other applications. The zoom, contrast, gridding and colour are all saved. You may find that printers other than Lasers can be used through Windows.

PCANIMAT/R - This command if preceded by CD PCANIM and issued from the command line or put into the AUOTEXEC.BAT file will force the program straight into receive mode. Useful for power cuts and unattended operation.

PCANIMAT/A - This command if preceded by CD PCANIM and issued from the command line or put into the AUOTEXEC.BAT file will force the program straight into animate only mode. Useful for exhibitions when people fiddle! Or it can be made into a separate batch file to impress your friends with an auto loading 100 frame demonstration.

ALT P - Invokes a dithered LaserJet II/III/IV printer dump that prints the screen in any Timestep program including any zoom, and contrast adjustment. This is much better than the menu derived print.

SMARTDRIVE - Some machines can be upset with Timestep and other programs when smartdrive is installed. Unfortunately the Windows installation procedure will automatically load the unfriendly program! If in doubt REM it out.

ELEMENTS - When using the Timestep or RIG BBS only download one set of elements. They are all computer generated at Timestep from original data supplied from the NASA BBS. By the very nature of their generation and checksum status they must always be absolutely identical. They are error and noise fee.

The TWOLINE file is the smallest and quickest to download, and can be loaded into all tracking programs as a TWOLINE or NASA file.

Remember both BBS's are updated Friday night at about 11:00pm. Calling at 9:00pm will get you old elements!

MORE ABOUT THE RIG LNA

E. van Belle, Rotterdam

I build the RIG LNA from the kit, according to the instructions, and it worked first time.

The reference I use is a feedhorn pointed directly towards Meteosat 5; the apt tones could clearly be heard; not noise free of course.

After adjusting the drain current of both FETs the LNA was mounted on a 3 turn helical.

After optimizing the focal distance we had good HRPT signals at elevations above 5 degrees. There was only a small amount of fast fading on the signal; no dips even when the satellite passed almost right overhead (85 degrees elevation). We used a 1.20 m dish with F/D 0.5 mounted on a YAESU rotor.

Unfortunately at the end of the pass the feedline got stuck, and the LNA, still in experimental housing, stopped working.

The PCB-board was bend a little which caused capacitor C8 to break. After reinforcing the PCB and replacing C8 the LNA didn't work well; too much noise and a low signal level; even on Meteosat 5.

After borrowing the LNA-kit from Max Miché and replacing U2 (72184A) I discovered two things:

The resistors R2 and R8 were smaller sized in Max's kit, and also of a different value! Only now, I realized that R2 and R8 packed in my kit (number 56) were 100 Ohm instead of 10 Ohm.

The 100pF chip-capacitors in Max's kit are 2mm long, whereas the ones in my kit are 3mm long. I think this difference could influence the working of the LNA because the length of these capacitors also fixes the distance between the FETs, coils and ground.

After replacing U2, R2 and R8 the drain currents where adjusted.

Unfortunately the LNA still did not work as well as in the beginning. I don't now if the broken chip capacitor could have caused damage to U1 or U3.

Below the actual measured values are given:

Output voltage 78L05 = 4.99 V

U1	Vsource	=	1.32 V	Idrain = 10 mA adjusted
	Vdrain	=	4.30 V	
	Vds	=	2.98 V	
U2	Vsource	=	1.61 V	Idrain = 7,3 mA (unadjusted)
	Vdrain	=	4.54 V	
	Vds	=	2.93 V	

The total current (12V from receiver) is about 32 mA.

That's why I have the following questions:

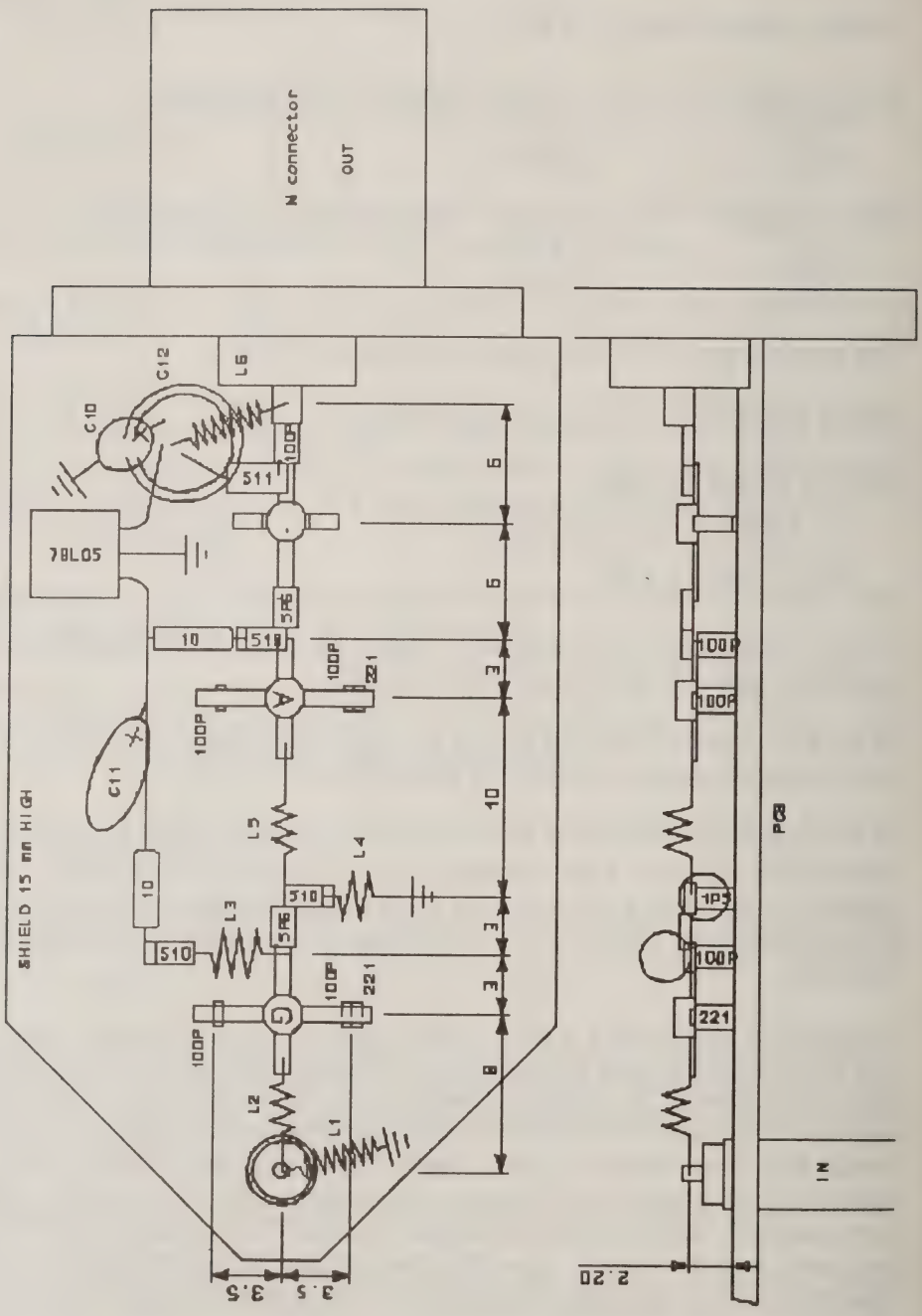
Drain to source voltages
On page 4 of "LNA DEVELOPMENTS.." : about 2 V
On page 1 of "Further Notes" : 2.5 to 3 V
Which value is best?

On the page with the components taped on the 5.6 pF capacitors are named C4 and C6, this should be C4 and C8 .

In My kit (kit number 56) R2 and R8 are 100 Ohm instead of 10 Ohm, with both resistor values I drain can be adjusted to 10 mA.

In "Further Notes" the value of R1 and R3 is given as 18 to 27 Ohm after adjustment, however after calculation and measuring my LNA this value should not be lower than 100 Ohm (or is my LNA faulty ?). I plan to build a second RIG LNA (the kit you sent to Huug van de Hoek) so I can compare the two.

The diagram printed here is an "as built" layout-drawing of the LNA. As you will see the feedthrough capacitor C12 is replaced by a small disc-capacitor and a N-connector is soldered directly to the PCB. The input is a 20mm length UT141 which is soldered to the monopole in the feedhorn or to the helical dish feed. Readers, please check this drawing and tell me if there is something to improve on. Maybe this drawing can be of use to other constructors. *[We have since heard that the author has replaced the HEMPT yet again and the LNA is now OK. The components in the kits are now labelled correctly. No idea where the 100 ohm resistor came from. Henry]*


N connector
OUT
C12
L6
C10
100P
511
78L05
5R6
10
510
100P
221
100P
C11
L5
L4
10
510
L3
5R6
510
100P
221
100P
L2
L1
SHIELD 15 mm HIGH
6
6
3
10
3
3
8
3.5
3.5
100P
100P
PCB
1P3
100P
221
IN
2.20

TIMESTEP HRPT SOFTWARE 10 BIT UPDATE - A REVIEW

Peter Hayes

I reviewed the Timestep HRPT reception system for high quality digital imaging from the NOAA series of Polar Orbiter weather satellites in RIG-29. Whilst the system gives excellent results, a few areas of possible improvement were noted. Recently, Timestep have produced the first official upgrade for their HRPT system, and this short review looks at the additional facilities provided.

The upgrade package is supplied on 2 x 3.5" discs, one containing the programs and the other containing a sample image for initial familiarisation with the new facilities. Installation couldn't be simpler; INSTALL C: is all there is to it; original files are overwritten where necessary, and you are now working in 10 bit mode. The only problem I came across was insufficient memory for image acquisition. The program is some 50kb larger than the original version and some fine tuning of CONFIG.SYS and AUTOEXEC.BAT may be needed; probably every computer will be different though.

The original review identified two main shortcomings; the need for additional zoom levels, and some means of using all 10 bits from the satellite instead of throwing away the lowest 2 bits. The present upgrade addresses both these problems.

As was noted in the original review, the average 14" VGA or SVGA monitor is incapable of reaching true pixel level within the main program. Pixels may indeed be visible on 17" or 20" monitors, but these are bulky and expensive devices, and few of us will be using one, especially on an "amateur" budget. The program was crying out for an additional zoom level, and this is provided with the upgrade. The three original zoom levels are maintained in their original form, and with a further click on "zoom in" an additional 4x zoom level is provided which now shows pixels clearly. For example, looking at the Leningrad (St. Petersburg) area, the causeways connecting Kronstadt to the mainland are clearly visible. Without the extra zoom level they were very difficult to see.

The other problem, the loss of radiometric resolution, has been completely eliminated. You now have the option of saving all passes in full 10-bit form, the only drawback being the higher speed requirement placed on the computer as it has to pack the 10 bit data into the DOS 8 bit form; however, should that prove to be a problem it is possible to drop off one

channel, say channel 5 which is similar, if not identical, to channel 4. It is also possible to save any band 256 bits wide from the 1024 from the satellite, although this mode of operation has to be used with care. Alternatively, you can save data in the original 8 bit form, although there seems little point in doing this other than to save disc space.

Having acquired the 10 bit data, the problem is now how to display 1024 greys on a 256 or 64 level monitor. Timestep's answer is to allow you to select the range of grey levels you wish to display, those outside the selected range will appear as black or white, since they have in effect been digitally clipped. This solution would seem to offer the greatest flexibility to the user. When displaying an image initially, the program gives you a display identical to that provided by the original software. By selecting the new "data range" facility from the Colours drop-down menu, a histogram analysis is performed, and the results displayed in a small box, together with two white marker lines. These lines can be moved with the mouse to select the data range you wish to concentrate on, the actual data values being displayed in the box. Click on "Select" and the image is redrawn using the data bits lying within the selected range. An "area" facility allows you to box off part of the image for histogram analysis, thus you can select, say, an area of sea, without nearby land adding unwanted confusion to your study of the histogram. You can produce a very accurate display of sea temperatures, down to well under 1 degree Celsius, and generate some very spectacular illustrations of sea currents.

Temperature readouts are now using full 10 bit data.

The new software is fully "downwards compatible", handling archived 8-bit data perfectly, the only difference being that the "data range" facility naturally doesn't work since the 8-bit file is displayed quite happily anyway. The additional zoom level revealed a lot not previously seen in my collection of NOAA passes! A short manual is supplied describing the technique for manipulating the 10 bit data, and a few minutes study using the supplied sample image (Sicily to Greece/Turkey) is all that's needed for an understanding of the program.

This upgrade would seem to confirm the package as a tool suitable for the professional user who requires full data acquisition and analysis for a wide variety of uses in connection with weather forecasting.

FOOD FOR THOUGHT...

A common problem in APT reception, especially on Polar Orbiters, is interference to the receiver from the computer system. Screening, coupled with long cable runs (getting the receiver as far as possible away from the computer) sometimes helps, as does isolating the two units with audio isolating transformers at each end. Unfortunately, some of the systems still produce interference, probably caused by a physical connection, RF wise, of the cable itself. One possible remedy would be to use fibre optics between the audio output of the receiver and the audio input of computer interface board. A few years ago, this would have been out of the question, but these days it can be relatively inexpensive. The emitter, and receiver modules can be obtained new for less than £20.00 each, and there are now custom chips, below £10.00 each, to interface the modules with the audio signals. Fibre optic cable has also come down in price, with short runs of 20 metres or so available from surplus sources. Built up fibre optic transmitter and receiver units have also been seen on the surplus market, so it is worth having a look around at the rallies. The modern equipment runs from 5V dc, and being of low power (up to 50mA) could be powered from the receiver and the computer. Although this seems a lot of work it does result in total isolation (electrically) of the two systems and could prove to be the only answer to some of the more severe interference problems. Mike.

INFO...

To get INSTANTRACK to read correct time use a batch file similar to...
CD TRACK SET TZ=GMT00 ITNCP.
Several functions are available from the map screen without leaving it. The left and right cursor keys will scroll through the satellites. Pressing the W key will tell you When the satellite is next due. Pressing E then D will give you the age of the elements. Pressing P will change the perspective (world view, satellite view, section view or star view). Pressing F goes into Fast mode, the pause key will freeze at any future fast time and space key continue. The S key will toggle on AND off the map scrolling function, try it if you haven't already. For really lazy users or those who haven't figured out how to add new satellites, simply download the IT.ORB file from the Timestep BBS and copy it straight into your INSTANT track subdirectory.
Dave Cawley.

A PYRAMIDAL HORN FOR L-BAND

Les Currington

In the early part of 1990 an article appeared in the New Scientist describing a HRPT receiving system for Third World countries using a Horn as the receiving device instead of the more usual Dish. It also showed a Horn and the mounting system complete with azimuth and elevation mounting.

It was also at about this time that I had nearly completed a home brew HRPT System but had not decided on the method of mounting the Dish. From the illustration it looked as if this was the answer to the tracking problem, but before undertaking the construction I thought it would be prudent to find out more about the theory of the horn as a receiving device and also to find out how much gain it was possible to obtain for a given size. All references to Pyramidal Horns showed them to be a broad band device, and able to present a near perfect match over a wide frequency range and also tolerant of small dimensional variations.

The RSGB VHF Manual had a very good section on Horns for amateur radio use, so I decided to do a few calculations to find the smallest size it was possible to build for a given gain. However it was soon discovered that all references to Horns were for a rectangular aperture and not the square as shown in the New Scientist article. Not to be deterred, I decided to use the figures for a square aperture and a maximum size that could be accommodated on a small conservatory roof. When the length of the horn is very large compared to the aperture the gain should be near the theoretical value, using the formula:

$$2\pi \frac{AB}{\lambda^2}$$

Where A and B are the dimensions of the aperture. With dimensions of 70cms. for the proposed Horn, we obtain a gain figure that looks very promising. Using the formula and the dimensions as in Fig (1), we have:

$$6.28 \times \frac{70 \times 70}{17 \times 17} = 109 \text{ (or approx 20 db.)}$$

So let construction commence! By a stroke of luck I found a source of offcuts of aluminium triangles which were large enough to cut the four sides of the Horn but this of course meant very difficult construction as each side

of the Horn had to be welded. It would have been much easier to construct if it could have been made from one piece and folded to the correct shape. It was thought wise to put a flange on the aperture to make it more rigid and also prevent the Horn from losing its shape.

A short length of aluminium tubing was also welded at the point of balance on the Horn which was then passed though the elevation rotator and counter balanced by a small block of moulded concrete on the other end. The matching waveguide section was made from a single sheet of aluminium which was easily bent to form a cavity in which the monopole aerial was fitted. The end backplate was made adjustable in order to give the required spacing from the aerial. Due to the lack of unobstructed ground space at garden level I decided to make a Horn mount suitable for mounting on to the conservatory roof where good coverage from east to west could be obtained. A base was constructed consisting of a large piece of heavy wood (Oak) in the shape of a cross, to which was mounted a short length of aluminium girder pole. Clamped to this pole were two sets of rotator bearings into which was inserted the main rotator pole.

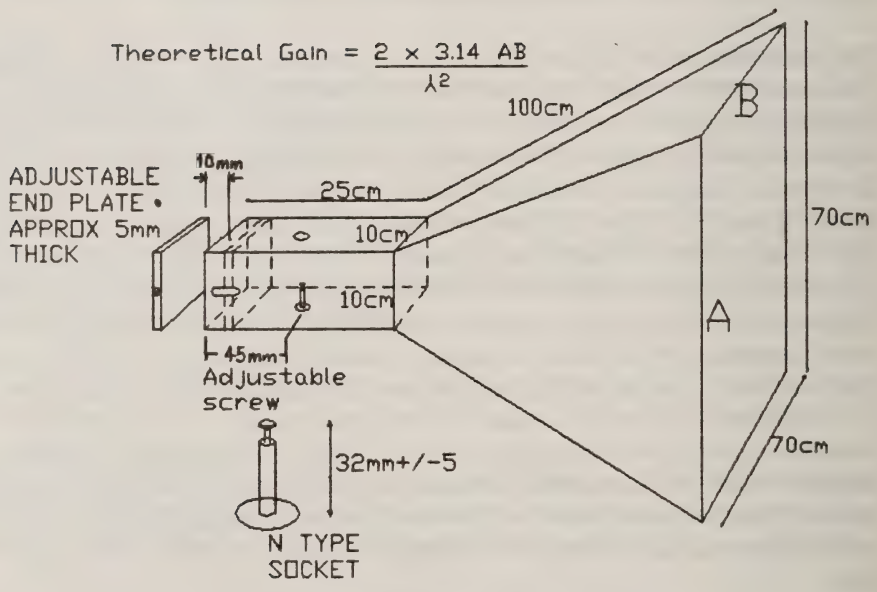
The main elevation control consisted of a Yaesu G500 rotator into which was inserted the short cross arm with the Horn on one end and the counter balance weight on the other. The azimuth rotator consisted of a very old reconditioned Stolle rotator mounted at the base. The whole unit forms a completely balanced assembly and so far has managed to survive all the recent gales! And now for the great day! The Gasfet preamp was removed from the old 4 ft dish and placed on the new Horn, and with great excitement it was beamed in the direction of Meteosat 4. As the rotator approached 30 degrees elevation it was with great relief that I saw the signal strength meter show a signal strength as good as with the original Dish and also a resultant picture completely free of noise. It was now time to maximise results by adjusting the end piece of the feed horn for maximum gain by releasing the screws on the end plate and adjusting the distance from the monopole. A short length of plastic knitting needle was filed to form a screw driver which was inserted through a hole in the cavity wall. The screw at the end of the monopole was then adjusted for maximum gain.

It was now possible to try and see how the Horn responded to rotation to Meteosat 3. With the greatest of ease from the warmth of the shack the rotator was turned to 230 degrees and up came Meteosat 3. The intention was to continue development of the Horn by adding matching screws, or 1/4 wave directors in front of the monopole. According to the theory this

would have possibly given a few more db's of gain. However experiments were brought to a sudden end by a heart problem which put an end to climbing on Conservatory roofs in 1992! But now due to my own piece of internal electronics 1993 may see the continuing development of the Horn. I think it would be fair to say that at present the results are slightly better than the 4ft Dish but with the benefit of a greater ease of rotation.

Lastly, it would be unfair not to mention help and suggestion freely given by another RIG contributor. Bob Sansoni, G4MWR.

Fig. 1



INFO...

Many thanks to one of our Italian members, Stefano Pellegrinelli, for sending us a copy of the Italian Electronics magazine "NUOVA ELETTRONICA". In their Oct-Nov edition they have as their major project a top notch Satellite receiver kit called the "LX.1095". The design concept appears to go a lot further than most we see here in Britain. It is a triple conversion scanner (132-140MHz - 32-40MHz - 10.7MHz - 455kHz) with an impressive alpha-numeric digital display. It is microprocessor controlled and has a keypad entry system. It would be a major project to construct, but as all the pcbs and parts are supplied, not beyond a keen electronics amateur. The article is 37 pages long, which includes all the alignment procedures. Although in Italian, most of the information can be gleaned without to many problems. Anyone interested could probably obtain a back issue direct from the distributors, Nuova Elettronica, Parrini e C. s.r.l., Roma, Piazza Colonna, 361, Italy. Tel: 06 6840731. Fax: 06 6840697.

Stefano tells us that the cost of the kit would be around £230.00 sterling including VAT. It would appear that a suitable case is an extra. We would be interested in receiving performance reports of any constructed by our members, here or overseas.

UPGRADES...

PC-SAT3 Update disk. Dec. 1992, as mentioned in RIG24, incl. MET3-4. £3.00 handling charge, state disk size required.

PROSAT-II Update disk, Dec. 1992. All previous upgrades, plus Swap IR/VIS on Noaa, plus minor fixes. SNOISE included on disk.
£3.00 handling charge, state disk size required.

SNOISE, Signal to noise measuring program for Meteosat (for ProsatII system only) Send disk and return S.A.E.

TIMESTEP HRPT DEMO DISK, 1.4Mb. £3.00 handling charge.

OFS WEFAX DEMO DISK, 1.4Mb. £3.00 handling charge.

All upgrades available only from the Chairman.

OFS SOFTWARE WEATHERFAX v.4.0

Peter Green

Well it all started with an idol question on two meters, "Bob have you ever done anything with weather satellites"? The reply was "I've got an old frame store here somewhere, I'll see if it still works". Well it did, and the rest is history. I was HOOKED.

I approached most of the UK distributors for information on a PC based system (with one exception their service was pathetic). I also read a review in QST May 1990 for a system from OFS Software which looked and sounded just the job. Being down in Devon I approached Dave Wright and asked what he thought of the review, his reply was favourable and unbiased, not being able to afford his company's excellent product. So I sent off my money. Within 10 days there was the board and software, so off I set.

Now, some two years later I am on Version 4.01 of the software.

System requirements are PC compatible with LIM 4.0 EMS RAM, I use 8 megs of ram, plus a 1 meg video card (TsengLabs 4000).

The opening screen gives you three options... Go to the Fax menu, Test the adaptor or Exit to Dos.

Most of the options have a Key letter highlighted in red; so hit T and you go to the onboard test menu. Four options are given here; Static test which allows you to set the board up for the Start/Stop tones; AM and FM Test which allows you to check the A/D converter; and Phased Locked Loop, Automatic Gain Lock circuit AM detector etc. When this is set, press escape to return to the opening Menu. With every option in the software there is on board help; just press F1 and it brings up the Help screen.

All screens are in Windows type format with drop down Menu's, so are very friendly to use.

Now on to the main Fax Menu. Six options are given to you here. Receive/File/Print/View/Loop and Setup.

Firstly it's best to go to Setup. The Setup menu allows you to select the type of display that your computer supports. With the software comes the latest VESA drivers, and the program will support SXGA up to 1280x1024

in 256 colours. Most of the available graphics boards are supported. Next set up your printer, again support is good up to HP LaserJet at 300 dpi, options for printer port, and up to wide carriage printers, are also available. There is an option for setting file directory (where you want your images stored) and Gridding locations. Here you put in your location co-ordinates for drawing gridding on to your NOAA/Meteor images. This program uses a two-point method for gridding, that eliminates the need for storing the current keplers, etc.

Next to the Receive Menu. The options here are for the type of image that you are going to receive. HF-Fax is supported, as well as WEFAX, Goes-Tap, and of course the Polar-Orbiters. All of them are supported without leaving the program to load other modules. To change the type of Fax just return to the Receive Menu and change the option there. When you exit the program all the parameters you have selected are saved to disk.

F4 allows you to configure the parameters required to acquire the image. All the above have their own screen with on line help.
The number of pixels per line can be varied from 64-2048, the number of lines per minute preset to 60, 90, 120, 180, 240, or variable to suit your requirements, the number of pixels per byte, whether you want to average the lines or not (depending on the amount of memory that you have). Doppler correction on or off. Very handy for the Polar Orbiters. F4 again allows you to set the audio input level (not required for Wefax) so as not to get clipping. Escape saves the parameters and takes you back to the main Receive menu.

F10 allows you to set the image the correct way up, it can also be done whilst receiving an image. Hitting S takes you to the Schedule Timer. Here you have the option to fill in twenty four time slots for the images that you require; these will be automatically saved to disk with the date and time as a file name.

Images can be saved as GIF or TIFF files. The timer waits for the start tone on WEFAX images, or on Polar Orbiters, it puts the system into receive at the time you set. Either when the system runs out of ram, or the end of the allotted time, arrives the image is saved to disk.

Hitting C at the Receive menu puts you straight into receive mode. Here you are presented with a black screen with a white action bar at the bottom. Waiting is the first state that is displayed with options for page alignment, disk on/off, printer on/off, adj contrast, adj brightness, or scroll the image.

Once you have received the required image you escape back to the main Fax menu and take the other options that await you.

Hitting F will allow you to file the image with you naming it.

V will allow you to view and enhance the image. Cursor keys allow you to scroll the image. End and Home allow you to quickly go from top of image to bottom. The image can be scrolled from top to bottom and side to side.

Press the space bar to obtain the enhancement tools that are available.

Colour allows you to set palettes for 8 different tables.

Histogram changes the contrast and brightness.

Enhance allows you to select Log-Black or Log-White; these are intended for the enhancement of visible images and are described in 'Weather Satellite Handbook' 4th Edition, and 20 NOAA/NESDIS curves intended for the enhancement of IR images.

Option. Allows you to zoom from 50-400 percent of the image. View the image in negative. Rotate or mirror the image. Temperature Calibration of IR images from NOAA satellites and the software stores NOAA calibration data for each satellite and can be updated by the user when a new satellite is available. This option will provide accuracy to less than one degree. Gridding Lat/Lon will allow you to grid the display with a useful 'You are Here' marker for when your location is obscured.

Returning to the main Fax menu again pressing P will give you the Print Options. Black/White; 4 or 16 grey shades are available. Range gives you the option of entire image or just the screen. You can also title the print, and print the current time and date at the top of the picture.

Lastly Loop. This option allows you to animate your WEFAX images. At present this is only available in SVGA 640x480x256 colours; but the results are very good indeed. I had great fun tracking hurricane Andrew recently. The number of images that can be displayed is only limited by the amount of your expanded memory. 13 images will take up approx 4 megs of memory. You also have the option of displaying these animated images in Fast/Med/Slow or individually, so that you advance the images with the cursor keys.

That really is a very brief description of the program. Having seen some other systems and judging by the results I have obtained with this system I am all in all very pleased to have purchased this product. I have exchanged images with people using HRPT systems and they have all commented on the quality of the images that I am receiving. I have found the author Jerry Dahl to be very receptive and responsive to suggestions and queries, and as yet, I have to find a bug in the program. He really does seem to test the software thoroughly before it's released.

The package comes with a professionally produced 47 paged instruction booklet about the size of a Rig magazine.

The WeatherFax package is obtainable with or without the animation software from: OFS WeatherFax 6404 Lakerest Court Raleigh NC 27612 Phone 1-919-847-4545.

Credit cards are now accepted, and a Demo disk of software and sample images are available for $10. *(A Demo disk is also available from Henry Neale for £3.00; see UPGRADES)*

I hope this short description is of use to those that are thinking of taking the plunge. I, and those people that have seen that results are very impressed with this package.

INFO

Users of Meteosat in APT format may soon be getting a better display of the British Isles and Europe. A new Meteosat, due for launch on 1.4.93, about a month away, will give a higher latitude view. Due to some anomalies in the Earth's Geomagnetic field, coupled with regular bursts of the Hydrazine correction booster rockets, it will be possible for the satellite to keep in a Geosynchronous orbit at approximately 30 degrees North in Latitude. This should go some way to reducing the foreshortened effect, due to the curvature of the Earth, that is very noticeable when viewing Britain. Another bonus will be the revised format (compatible with present format on our machines) on Infra-Red images. It is planned to keep the contrast ratio constant over the year, and add calibration bars at the side of the sync bars (similar to Noaa) for temperature readings. No doubt our commercial suppliers will be able to write some extra software to enable us to make direct temperature readings as we do on Noaa images at present.

50Hz IN... 60Hz OUT

Graham Smith

The 2400Hz to 1020Hz frequency conversion circuit in RIG 30 reminded me of a novel circuit in a book called '301 circuits'. You can feed 50Hz in and get 60Hz out or vice versa, using an XR2240 (or uA2240C) Timebase IC. It is reprinted by kind permission of Elektor Electronics (Publishing).

What use is it? Running my vintage Muirhead D900 and D901 at 240 RPM, which normally go at 200 RPM on 50 Hz. I can use a standard 50Hz Xtal oscillator/divider (e.g. M706BI) feeding an audio amplifier into a reversed mains transformer, with just one extra IC inserted in the chain to run the hysteresis motor faster. A special crystal is not then required to produce the 60Hz.

Data sheets for the 2240 are available from Radiospares (sheet 3942 July 1984) and Maplin (Sheet CP99). The book (ISBN 0 905705 12 2) makes very good reading anyway and is in print again at £10.70 including p&p. Tel: 0305 250995.

The circuit and text on the following page is reproduced with kind permission of Elektor Electronics.

FOR SALE...

Martelec MSG20 'Graphstore' high resolution frame store for use with BBC 'B' computer, complete with 'Grace' EPROM and documentation. £150.00 ono

BBC 'B' issue 7 computer with 'Solidisk 128' sideways ramboard plus Solidisk DFDC board providing 8271DFS +1770DFS +ADFS also including Sideaid128 plus documentation + Misc Software. Also single 40/80 track disk drive. Green Screen Monitor needs 12v supply. £150.00 ono

The above BBC 'B' + Martelec frame store as a weather package £250.00

Acorn 1770DFS board with 1770DFS rom +1770ADFS 1.3 rom £20.00

Old style solidisk 128k sideways ram board for BBC 'B' + manual £10.00

Watford 'Dumpout 3' graphics rom for BBC 'B' + manual £10.00

Buyer collects or pays carriage. Cash preferred.

Call Mike Horrocks G8GTP 061 766 6269

Frequency conversion can be carried out very easily with the aid of this IC. For instance, when using American clock ICs there may be a requirement to convert a signal with a frequency of 50 Hz into a signal with a frequency of 60 Hz. The formula for determining the output frequency of the XR 2240 is:

$$f_o = \frac{m}{N + 1} \cdot f_{in}$$

where

f_o = the output frequency

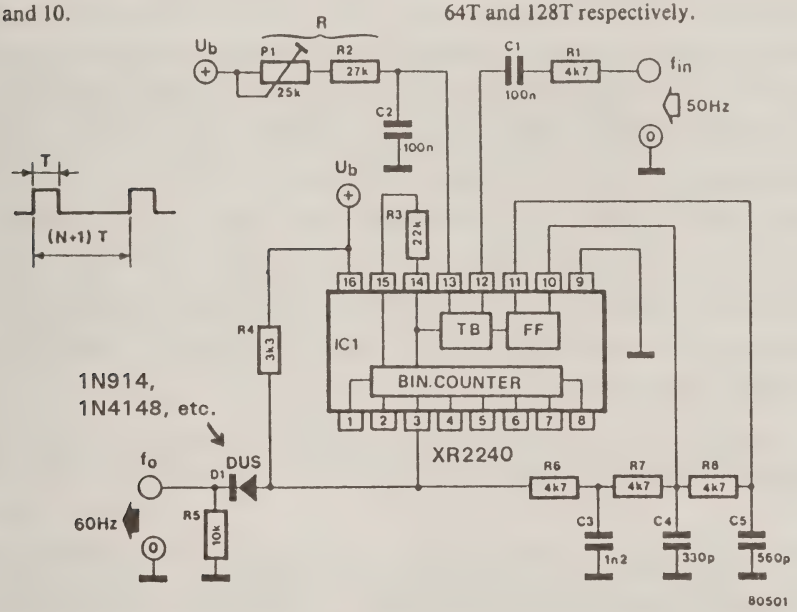
m = the ratio of the input frequency to the time base frequency. This ratio is determined by the position of the potentiometer and is a whole number between 1 and 10.

N = a whole number between 1 and 255 which may be selected by connecting one or more of pins 1...8.

f_{in} = the input frequency

When m = 6 and N = 4 the output frequency will be 60 Hz for an input frequency of 50 Hz. Similarly, when m = 5 and N = 5 the output frequency will be 50 Hz for an input frequency of 60 Hz.

The XR 2240 contains a control flip-flop FF, a time base generator TB and an eight bit binary counter. The period T of the signal produced by the time base generator is determined by the RC product of the components connected to pin 13. Signals are then available at the outputs on pins 1...8 with periods of T, 2T, 4T, 8T, 16T, 32T, 64T and 128T respectively.



If, for example, the outputs T and 4T (pins 1 and 3) are connected to the 3k3 pull up resistor (R4), the generated signal will have a period of T + 4T = 5T. This provides the 'N' factor given in the formula.

A positive going input signal at pin 12 will trigger the time base generator and reset the binary counter. The counter will then operate until the next positive going input pulse occurs.

In the circuit shown the required output frequency is 60 Hz for an input frequency of 50 Hz. Therefore, the frequency of the time base generator needs to be preset to the sixth harmonic of 50 Hz which is 300 Hz (m = 6). This is accomplished with the aid of the potentiometer. With the output from pin 3 (4T) connected, the result is N = 4.

The circuit will operate satisfactorily with a supply voltage of between 4 and 15 volts. With a supply voltage of 9 volts the current comsumption is approximately 8 mA. The synchronisation (input) signal needs to be a square wave with a minimum amplitude of 3 V. The maximum frequency of the time base generator is quoted as being 100 kHz (C2 = 6n8, R = P1 + R2 = 1 k).

PDUS UPDATE

James Brown

The Timestep PDUS system is almost a year old now, so a birthday cake may well be in order, but at the end of 1992 as promised a software update arrived which really did put the icing on the cake as far as this reviewer is concerned. Visitors to the shack have invariably gone away vowing to save their coppers for a system, so the respect for the package is far from being merely personal. At the time of writing, I am unclear what the new pricing policy will be, but if it is not much changed, then I would stick my neck out and argue that Timestep's PDUS system is likely to become the main system for the reception and display of METEOSAT images in the future. However, we shall see....

Interestingly, as the number of PDUS users have increased so have the discoveries of the factors involved in obtaining an adequate signal to noise ratio. One user reported that he found the voltage supplied by his PC to be around the 11.6 mark, instead of a straight 12v, and powering the PDUS system separately, dramatically improved the signal to noise ratio. I checked mine and it was actually 11.3v! Perhaps I get away with it because I do power the RIG design LNA separately, and that gets a clean 12v. Another user found that the dipole on his cassegrain reflector was too short, and the addition of adjustable screws on the ends of the dipole again brought his pictures right out of the noise. So all in all it's a good way of finding out your system weaknesses!

The new software comes with an updated manual, and most of the changes have been documented. What are these?

Although not directly mentioned in the manual, the receive section on the menu now has the bonus of an unattended save option. Times can be set up à la Prosat and files will be dumped to your hard drive in your absence. There are some friendly options for adding and removing times, and for single or multiple savings. Make sure your PC clock is correct, and your hard disk really does have enough space, and you're on your way.

Under the display menu is the promised implementation of the temperature calibration, and it is indeed everything as promised, and perhaps more. The user has the option of using a mouse pointer to read individual pixels in the infra red channel, and the corresponding temperature is displayed, or of doing a colour slice, where each colour represents a band of temperatures, which can either be as set by the programmer, or set by you as the user.

The displays are quite spectacular. When you bear in mind that the area covered is no longer just the range of a NOAA pass, but from the Antarctic to the Peruvian desert, from Iraq to Newfoundland, the range of temperatures and the display are truly amazing, and for anyone remotely interested in climatology, a source of endless fascinating study. In addition the water vapour channel has also been calibrated, so the data there can be read off and analyzed, but it'll be some time before I know exactly what I am looking at in that spectral window!

How accurate is infra-red detail from a satellite some 36,000 miles out in space? Well the main thing which you have to bear in mind is the thickening of the atmosphere that a sensor on a geostationary satellite has to cope with as the earth curves away in every direction from the sub-satellite point. It becomes increasingly difficult to have pure atmospheric transparency in terms of 'seeing' sea and land values as the scan approaches the outer edges of the earth disk view. In practical experiments the figures on a clear day seem to be highly accurate (compared to say NOAA) as far north as Southern France, but are beginning to lose their accuracy by the time Great Britain comes in view. It seems to be as much as 4 or 5 degrees for temperatures in the North Sea, for example, but a lot more research will have to be done before drawing any firm conclusions. I have not yet taken the plunge and attempted to come to grips with METEOSAT documentation, so I am unable to assess at present the satellite's specified ability at this level and thus compare it with the PDUS readout. Watch this space! However the more important thing perhaps is the long-term stability of this measurement, so that the amount of the inaccuracy remains the same. I noticed that Timestep have included calibration files for METEOSAT 3, 4, and 5 (automatic detection), so this side of the package provides for every possible contingency.

But this is only the beginning... the update has taken us into new possibilities as far as animation is concerned. This has always been for me perhaps the most significant plus of the geostationary satellite. The ability to transmit data of an identical spatial area, and hence open the door to a visual representation of the atmosphere in motion. No HRPT'er can ever hope to do that! Having raved over the pre-release version I was sent some months ago, I can only add that the new edition leaves one wondering if there is anything left to do! You the animator now have the choice of the infra-red, visual or even water vapour channels for the animation sequence. Though the infra-red will remain the firm favourite, given enough sun illumination, the visual is almost breath-takingly beautiful to watch, as cloud and shadow detail build and decay, and glide across the globe. An essential

meteorologist's tool for short-term forecasting, and now in your own home! The (by now) familiar colour banding available from lowest temperature downwards is still there, and in the recent anticyclonic spell over Europe I set up a sequence to examine the movement of the cold air pool, and was amazed at the diurnal effects on the cloudless land areas, as the colder colours progressed west during the night, and retreated east during the day, only to advance west again as dusk fell. Was this poetry in motion I ask! There is an option in this menu to set up a colour slice of a specific small band of temperatures, useful for tracking locusts and the like, but it has not been implemented at the time of writing. As before you can have many sequences set up for different parts of the world or channels, but don't expect simultaneous reception or display - well not yet anyway!! There is still some 'jiggling' of pixels across the picture from time to time, but whether this is a satellite fault or not remains to be seen. A very minor irritation which in no way detracts from the package. Well some updates merely deal with bugs and tidy one or two details up, but it has to be said that this one is rich in innovative goodies which push METEOSAT reception to new limits of excellence. I am totally unbiased in giving this latest enhancement the thumbs up, and would be less than fair if I were not to give praise where praise is due, so congratulations to the one year old, and many happy returns!

FOR SALE...

Dartcom VHF Scanning Receiver. LED readout, smartly boxed, complete with S-meter and level control, plus audio, squelch, and scan controls on the front panel. Needs 12vdc at 600mA.
Start Haggling at £130.00 + carriage
PC Sat3 Board and software also available if required £35.00
Contact: Jack Roberts, G3GZQ. Tel: 0364 43608. S.Devon.

WANTED... HELP PLEASE!

XEROX 295 Telecopier worked well until PSU gave up.
Has anyone details/circuit, etc. of which I could have a photocopy? Expenses refunded.
David Riches, 92 Barons Road, Bury St.Edmunds, IP33 2LY
Tel: 0284 701034.

INTERPRETING WEATHER SATELLITE IMAGERY - PART 3

Peter Wakelin

One criticism of the content of the RIG journal revealed by the recent membership survey is that newcomers are not being adequately catered for. As all new members receive the journal from March irrespective of which month they join I intend to devote the first article of this series each year to topics more appropriate to beginners. Hopefully, more experienced members will also find something of interest.

My two images at the centre of this journal were taken from Meteosat 4 SDUS D2 formats for 0700 and 1230 on 30 December 1992. It is difficult to get very far without using technical jargon and acronyms so, where appropriate, I will give brief explanations. The Meteosat spacecraft transmit high resolution imagery in digital form and these can be received by Primary Data User Stations (PDUS).

These images are also received and processed at Darmstadt in Germany, sent back to the satellite from where they are retransmitted at lower resolution and in analogue form to Secondary Data User Stations (SDUS). D2 is simply the centre section of the northernmost row of a 3x3 grid on the Earth's disc as viewed from Meteosat in the infra-red (IR) part of the spectrum at a wavelength of 11 micrometres. A "C" precedes the digit for visible light images and an "E" for images in the 6.3 micrometre water vapour channel. As the D2 format covers all of Europe and much of North Africa and is available up to 48 times every day I suspect that it is the most commonly received format among RIG members.

The 11 micrometre wavelength has been selected for the IR images because this radiation is not absorbed by the atmosphere so what Meteosat "sees" is the radiation from the underlying surface whether it be land, sea, ice or cloud tops. Fortunately, land, water and ice have fairly similar radiative properties and as the quantity of radiation emitted is dependent upon temperature it follows that parts of the image with similar colours will have similar temperatures. On Meteosat images (and also on the NOAA satellite IR images)higher temperatures are represented by darker colours.

Now let's consider the two images. Firstly, note that one is timed at the end of a long, mid-winter's night and the other just 5.5 hours later. On the 0700 image the land/sea temperature difference is very noticeable. Even the Sahara Desert is very much colder than the Mediterranean Sea. On land the diurnal temperature variation is confined to the top few cm and a 40 degree

day to night change is common in summer. In water, mixing results in an insignificant diurnal variation in surface temperature. Even the annual variation in sea temperature at a given place is seldom more than about 7C diurnally. Cloud temperatures also change very little overnight as the tiny droplets they are comprised of cannot have a significantly different temperature from the air in which they are suspended.

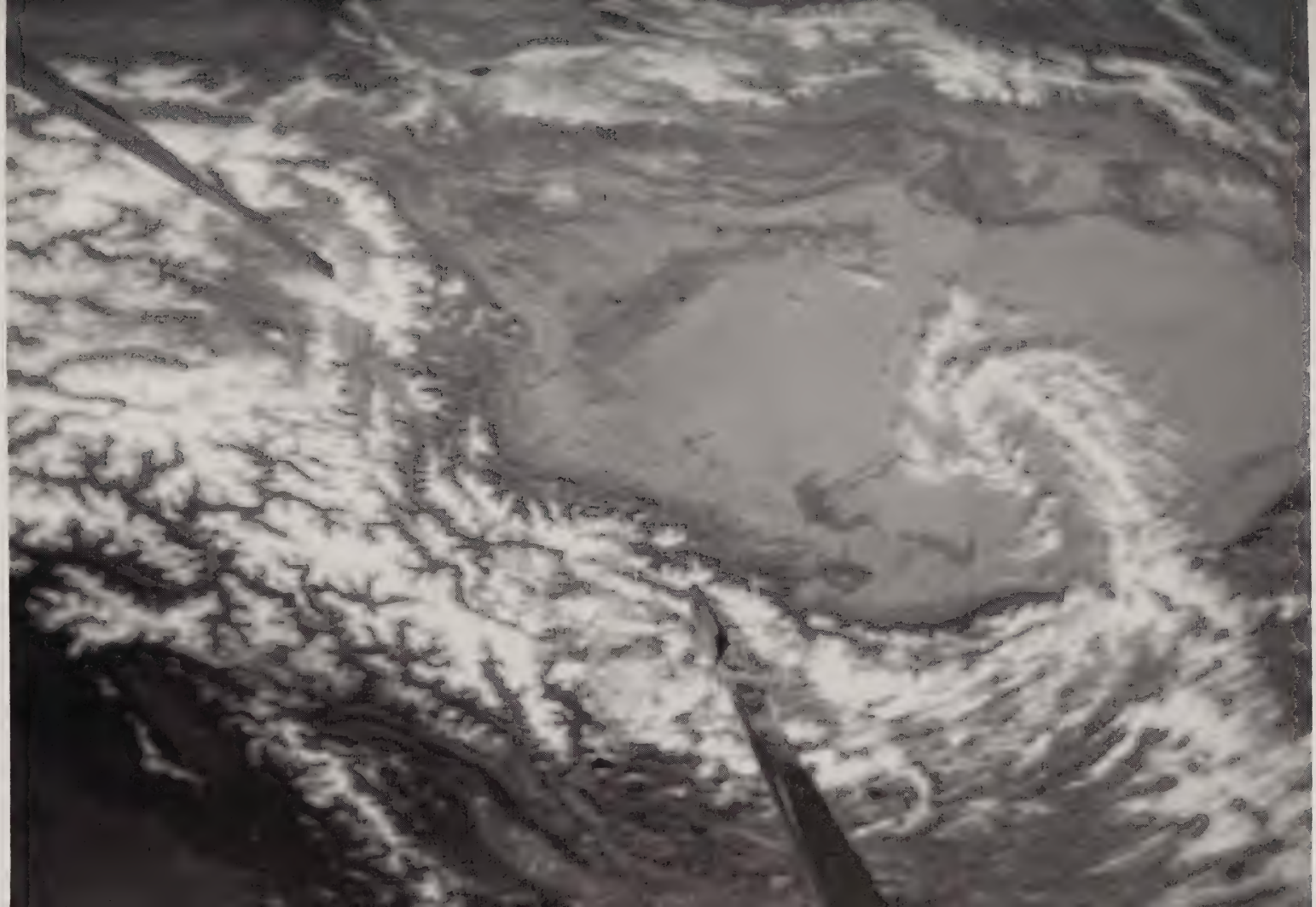
Therefore it is hardly surprising to find that the only significant temperature differences between the two images occur in the land areas and then only south of about 55 degrees north latitude. Above this latitude little or no sunshine reaches the ground in mid-winter.

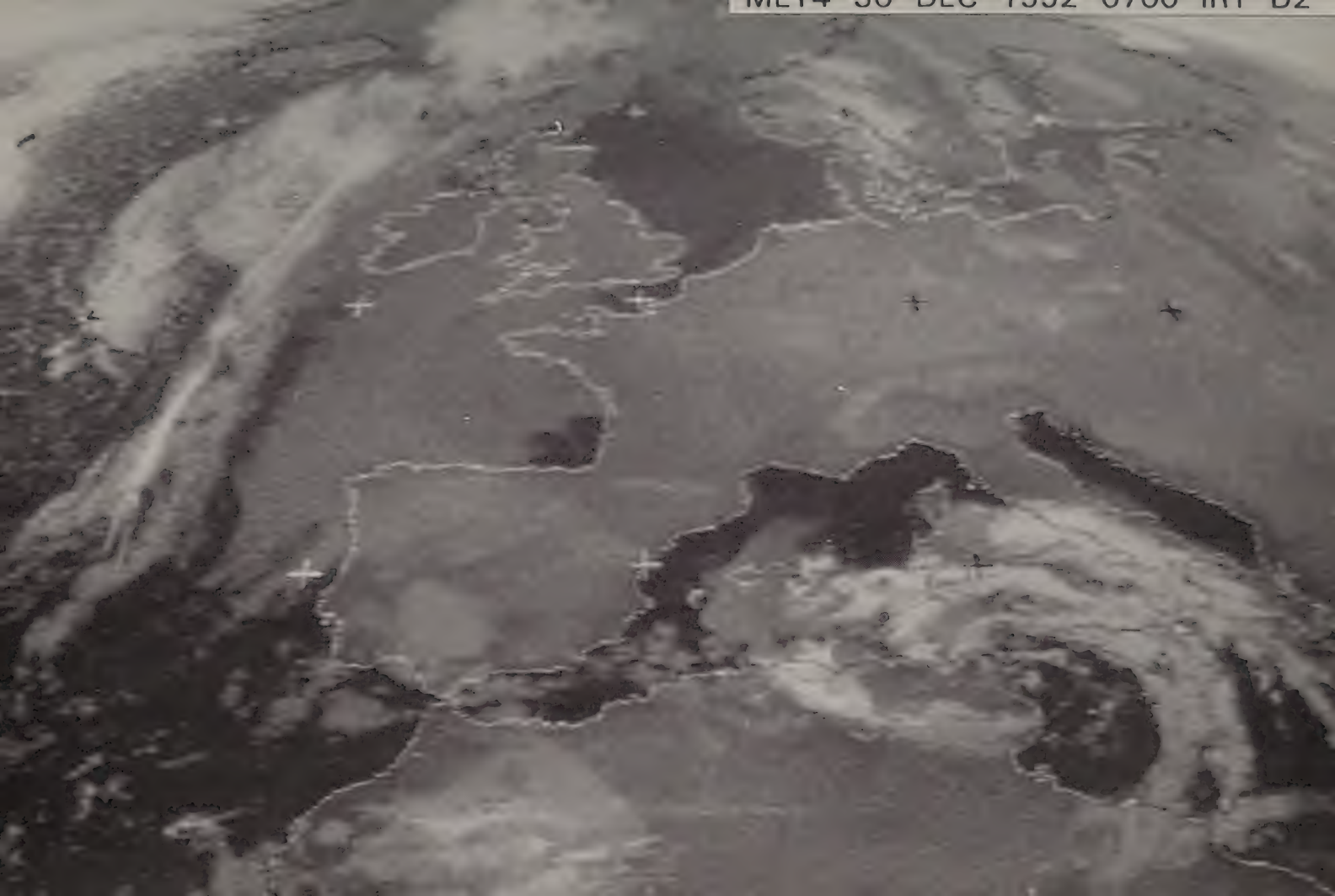
Clouds are depicted in various shades of grey. The dark ones near the Canary Islands are almost as warm as the ocean while those over Italy are clearly very much colder. Most readers will realise that temperature decreases with height (Mt Kilimanjaro situated close to the equator is permanently ice-capped) so we now have a three-dimensional view of Europe with major areas of cold, high cloud over the Mediterranean Sea and to the north-west of the British Isles. These cloud tops are probably around 10 Km altitude with a temperature about -50C.

The large area of cloud between Spain and the UK is much warmer and lower. I have not included a surface pressure chart this time but the 1200 chart from Bracknell showed one depression near Sicily and another to the northwest of Ireland with a large anticyclone covering much of Western Europe. This suggests a correlation between surface pressure and high cloud.

In the vicinity of depressions air is rising and as it does so it expands and cools. Eventually its water vapour content becomes saturated and further cooling results in water droplets or ice particles forming to create clouds. Obviously air cannot be rising everywhere and it is in the high pressure areas or anticyclones where it is descending. When it does so it is compressed and warmed. Its water vapour will no longer be saturated and clouds will evaporate. Anticyclones are usually, therefore, free of cloud at most heights though, in Winter and especially over the sea, there is sometimes a persistent layer of low cloud. That is the case in this example and the tops are typically at 1 or 2 kilometres altitude.

One of the difficulties in interpreting IR images is distinguishing low cloud from land. Take the cloud sheet to the southwest of Britain on the 0700 image for example. It obviously extends along the English Channel and up




ME14 30 DEC 1552 0700 INT B2

NOAA 9 PERIOD 101.93 MINS FREQUENCY 137.62MHz

TIME OF ACQUISITION OF SIGNAL - 52.5 DEG NORTH 0 DEG EAST

14/03	09.18	19.08	16/04	08.58	18.48	19/05	08.37	18.28
15/03	09.05	18.55	17/04	08.45	18.35	20/05	08.24	18.15
16/03	08.52	18.42	18/04	08.32	18.22	21/05	08.11	19.44
17/03	08.39	18.29	19/04	08.19	19.51	22/05	07.58	19.31
18/03	08.26	18.17	20/04	08.06	19.38	23/05	09.27	19.18
19/03	08.13	19.45	21/04	07.53	19.25	24/05	09.14	19.05
20/03	08.00	19.33	22/04	09.22	19.12	25/05	09.01	18.52
21/03	07.47	19.20	23/04	09.09	18.59	26/05	08.48	18.39
22/03	09.16	19.07	24/04	08.56	18.46	27/05	08.35	18.26
23/03	09.03	18.54	25/04	08.43	18.34	28/05	08.22	19.55
24/03	08.50	18.41	26/04	08.30	18.21	29/05	08.09	19.42
25/03	08.37	18.28	27/04	08.17	19.50	30/05	07.56	19.29
26/03	08.24	18.15	28/04	08.04	19.37	31/05	09.25	19.16
27/03	08.11	19.44	29/04	07.51	19.24	01/06	09.12	19.03
28/03	07.58	19.31	30/04	09.20	19.11	02/06	08.59	18.50
29/03	07.45	19.18	01/05	09.07	18.58	03/06	08.46	18.37
30/03	09.14	19.05	02/05	08.54	18.45	04/06	08.33	18.24
31/03	09.01	18.52	03/05	08.41	18.32	05/06	08.20	19.53
01/04	08.48	18.39	04/05	08.28	18.19	06/06	08.07	19.40
02/04	08.35	18.26	05/05	08.15	19.48	07/06	07.54	19.27
03/04	08.22	18.13	06/05	08.02	19.35	08/06	09.23	19.14
04/04	08.09	19.42	07/05	07.49	19.22	09/06	09.10	19.01
05/04	07.56	19.29	08/05	09.18	19.09	10/06	08.57	18.48
06/04	07.43	19.16	09/05	09.05	18.56	11/06	08.44	18.35
07/04	09.12	19.03	10/05	08.52	18.43	12/06	08.31	18.22
08/04	08.59	18.50	11/05	08.39	18.30	13/06	08.18	19.51
09/04	08.46	18.37	12/05	08.26	18.17	14/06	08.05	19.38
10/04	08.33	18.24	13/05	08.13	19.46	15/06	07.52	19.25
11/04	08.20	18.11	14/05	08.00	19.33	16/06	09.21	19.12
12/04	08.07	19.40	15/05	09.29	19.20	17/06	09.08	18.59
13/04	07.54	19.27	16/05	09.16	19.07	18/06	08.55	18.46
14/04	09.23	19.14	17/05	09.03	18.54	19/06	08.42	18.33
15/04	09.10	19.01	18/05	08.50	18.41	20/06	08.29	18.20

MORNING PASSES ARE SOUTHBOUND EVENING PASSES ARE NORTHBOUND

NOAA 10 PERIOD 101.13 MINS FREQUENCY 137.50MHz

TIME OF ACQUISITION OF SIGNAL - 52.5 DEG NORTH 0 DEG EAST

14/03	06.50	18.17	16/04	06.59	18.26	19/05	07.08	16.54
15/03	06.26	17.53	17/04	06.35	18.02	20/05	06.44	18.11
16/03	07.43	17.29	18/04	07.52	17.38	21/05	06.19	17.47
17/03	07.18	17.05	19/04	07.28	17.14	22/05	07.36	17.22
18/03	06.54	18.21	20/04	07.03	16.49	23/05	07.12	16.58
19/03	06.30	17.57	21/04	06.39	18.06	24/05	06.48	18.15
20/03	07.47	17.33	22/04	06.15	17.42	25/05	06.24	17.51
21/03	07.23	17.09	23/04	07.32	17.18	26/05	07.40	17.27
22/03	06.58	18.26	24/04	07.07	16.54	27/05	07.16	17.02
23/03	06.34	18.01	25/04	06.43	18.10	28/05	06.52	18.19
24/03	07.51	17.37	26/04	06.19	17.46	29/05	06.28	17.55
25/03	07.27	17.13	27/04	07.36	17.22	30/05	07.45	17.31
26/03	07.03	16.49	28/04	07.12	16.58	31/05	07.20	17.06
27/03	06.38	18.06	29/04	06.47	18.15	01/06	06.56	18.23
28/03	06.14	17.41	30/04	06.23	17.50	02/06	06.32	17.59
29/03	07.31	17.17	01/05	07.40	17.26	03/06	07.49	17.35
30/03	07.07	16.53	02/05	07.16	17.02	04/06	07.24	17.10
31/03	06.43	18.10	03/05	06.51	18.19	05/06	07.00	16.46
01/04	06.18	17.46	04/05	06.27	17.54	06/06	06.36	18.03
02/04	07.35	17.21	05/05	07.44	17.30	07/06	06.12	17.39
03/04	07.11	16.57	06/05	07.20	17.06	08/06	07.28	17.15
04/04	06.47	18.14	07/05	06.56	18.23	09/06	07.04	16.50
05/04	06.22	17.50	08/05	06.31	17.59	10/06	06.40	18.07
06/04	07.39	17.25	09/05	07.48	17.34	11/06	06.16	17.43
07/04	07.15	17.01	10/05	07.24	17.10	12/06	07.33	17.19
08/04	06.51	18.18	11/05	07.00	16.46	13/06	07.08	16.54
09/04	06.27	17.54	12/05	06.35	18.03	14/06	06.44	18.11
10/04	07.44	17.30	13/05	06.11	17.38	15/06	06.20	17.47
11/04	07.19	17.05	14/05	07.28	17.14	16/06	07.37	17.23
12/04	06.55	18.22	15/05	07.04	16.50	17/06	07.12	16.58
13/04	06.31	17.58	16/05	06.40	18.07	18/06	06.48	18.15
14/04	07.48	17.34	17/05	06.15	17.43	19/06	06.24	17.51
15/04	07.23	17.10	18/05	07.32	17.18	20/06	07.41	17.27

MORNING PASSES ARE SOUTHBOUND EVENING PASSES ARE NORTHBOUND

NOAA 11 PERIOD 101.98 MINS FREQUENCY 137.62MHz

TIME OF ACQUISITION OF SIGNAL - 52.5 DEG NORTH 0 DEG EAST

14/03	03.39	15.12	16/04	03.40	15.13	19/05	03.41	15.14
15/03	03.27	15.00	17/04	03.28	15.01	20/05	05.11	15.02
16/03	04.56	14.47	18/04	04.58	14.49	21/05	04.59	14.50
17/03	04.44	14.35	19/04	04.45	14.37	22/05	04.46	14.37
18/03	04.32	14.23	20/04	04.33	14.24	23/05	04.34	14.25
19/03	04.19	14.10	21/04	04.21	14.12	24/05	04.21	14.13
20/03	04.07	13.58	22/04	04.08	14.00	25/05	04.09	14.00
21/03	03.55	15.28	23/04	03.56	15.29	26/05	03.57	15.30
22/03	03.42	15.16	24/04	03.44	15.17	27/05	03.44	15.17
23/03	03.30	15.03	25/04	03.31	15.04	28/05	03.32	15.05
24/03	05.00	14.51	26/04	05.01	14.52	29/05	05.02	14.53
25/03	04.48	14.39	27/04	04.49	14.40	30/05	04.49	14.40
26/03	04.35	14.26	28/04	04.36	14.28	31/05	04.37	14.28
27/03	04.23	14.14	29/04	04.24	14.15	01/06	04.25	14.16
28/03	04.11	14.02	30/04	04.12	14.03	02/06	04.12	14.03
29/03	03.58	15.31	01/05	03.59	15.32	03/06	04.00	15.33
30/03	03.46	15.19	02/05	03.47	15.20	04/06	03.48	15.21
31/03	03.34	15.07	03/05	03.35	15.08	05/06	03.35	15.08
01/04	05.03	14.54	04/05	05.04	14.55	06/06	05.05	14.56
02/04	04.51	14.42	05/05	04.52	14.43	07/06	04.52	14.44
03/04	04.39	14.30	06/05	04.40	14.31	08/06	04.40	14.31
04/04	04.26	14.17	07/05	04.27	14.18	09/06	04.28	14.19
05/04	04.14	14.05	08/05	04.15	14.06	10/06	04.15	14.06
06/04	04.02	13.53	09/05	04.03	15.36	11/06	04.03	15.36
07/04	03.49	15.22	10/05	03.50	15.23	12/06	03.51	15.24
08/04	03.37	15.10	11/05	03.38	15.11	13/06	03.38	15.11
09/04	05.07	14.58	12/05	05.08	14.59	14/06	05.08	14.59
10/04	04.54	14.45	13/05	04.55	14.46	15/06	04.56	14.47
11/04	04.42	14.33	14/05	04.43	14.34	16/06	04.43	14.34
12/04	04.30	14.21	15/05	04.31	14.22	17/06	04.31	14.22
13/04	04.17	14.08	16/05	04.18	14.09	18/06	04.18	14.10
14/04	04.05	13.56	17/05	04.06	13.57	19/06	04.06	15.39
15/04	03.53	15.26	18/05	03.54	15.27	20/06	03.54	15.27

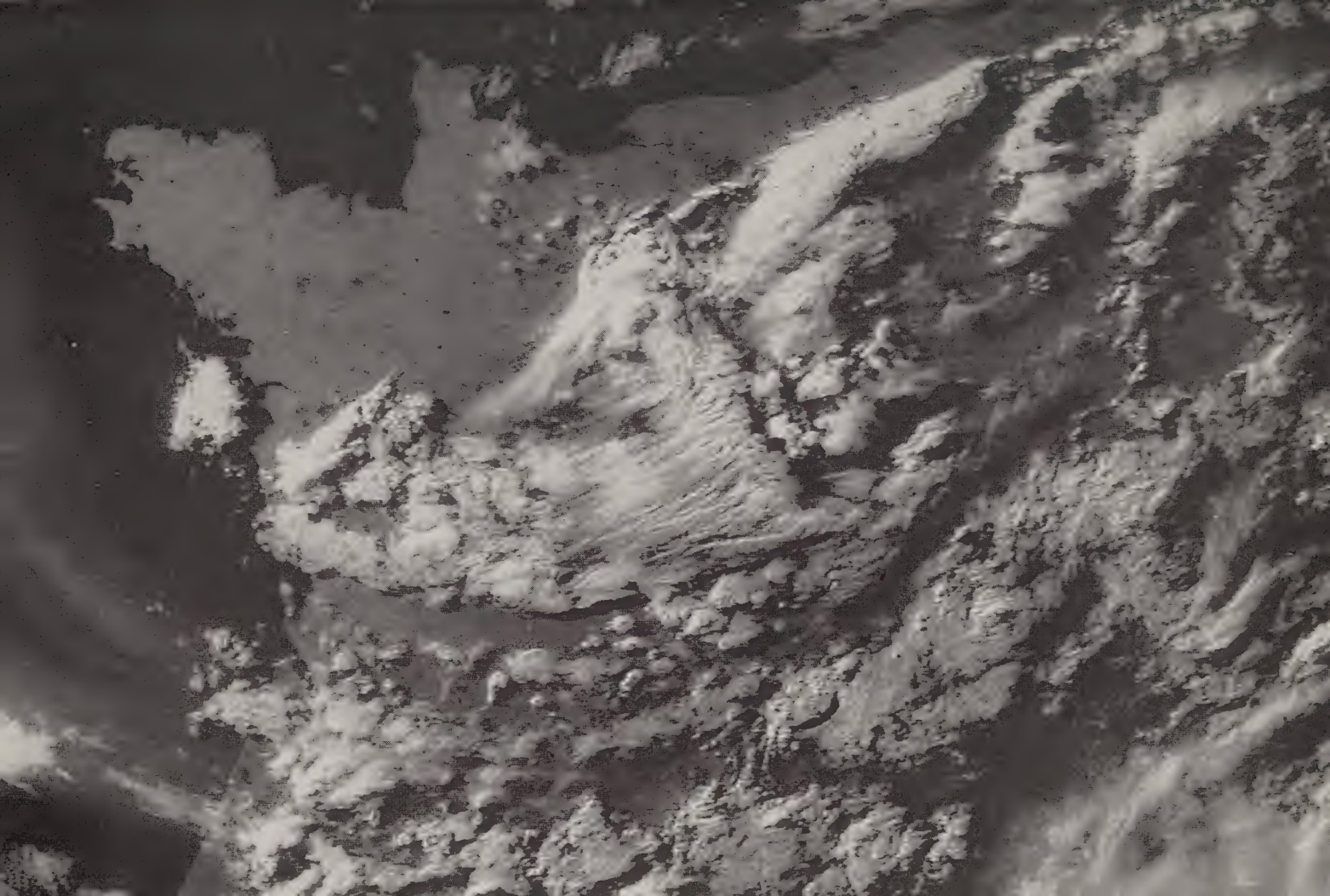
MORNING PASSES ARE SOUTHBOUND EVENING PASSES ARE NORTHBOUND

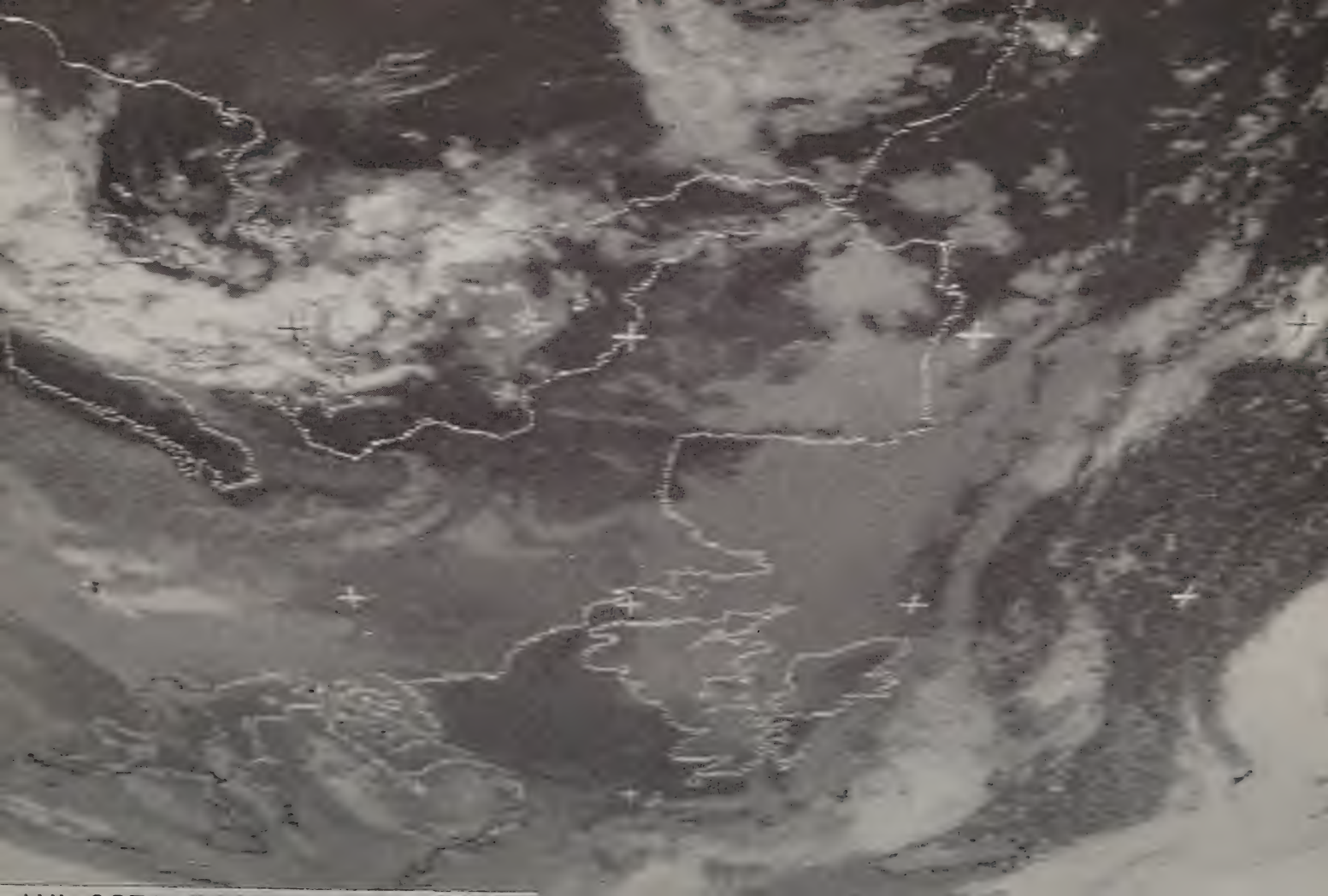
NOAA 12 PERIOD 101.31 MINS FREQUENCY 137.50MHz

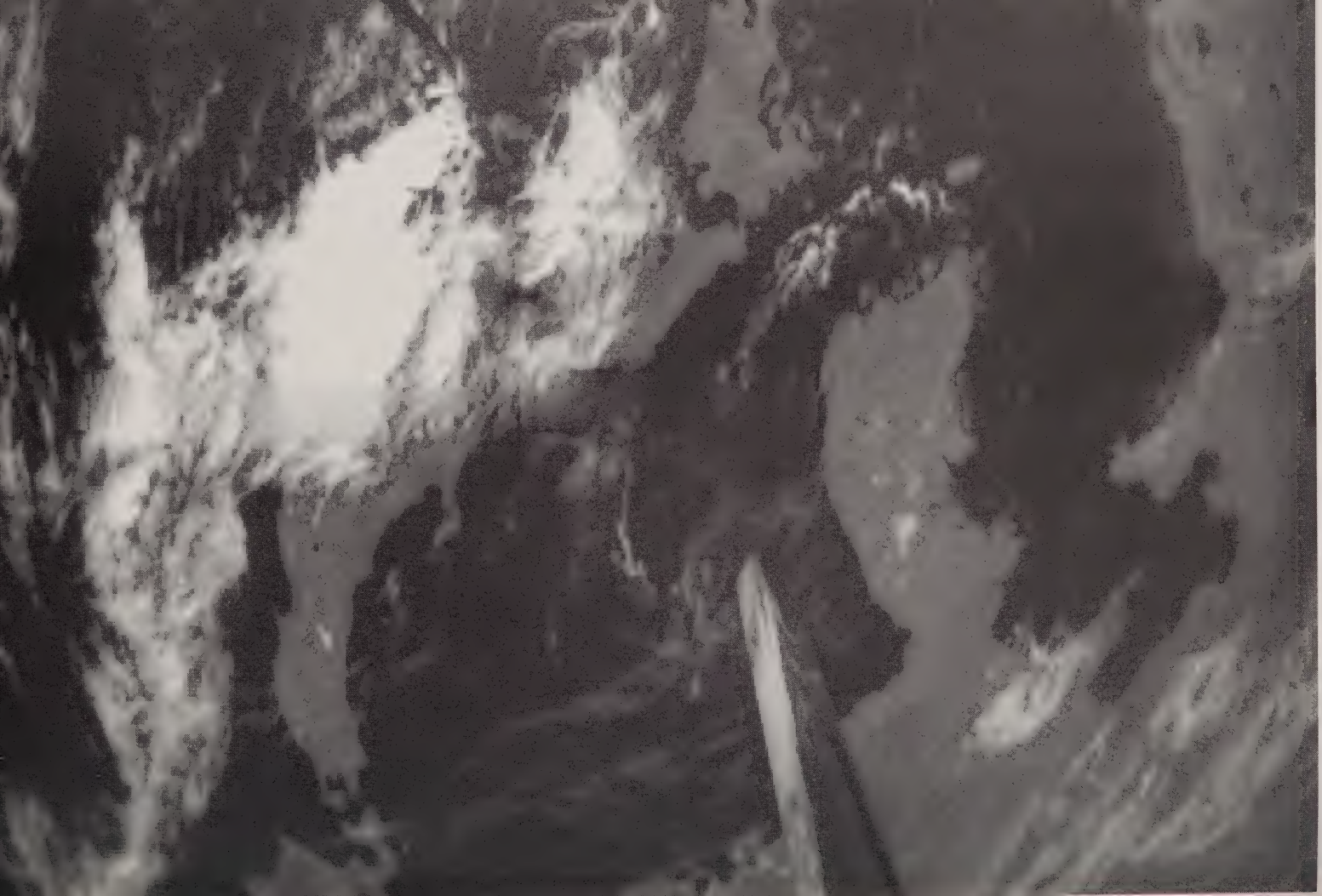
TIME OF ACQUISITION OF SIGNAL - 52.5 DEG NORTH 0 DEG EAST

14/03	08.30	18.17	16/04	08.23	18.10	19/05	08.15	18.03
15/03	08.08	17.55	17/04	08.01	17.48	20/05	07.54	19.22
16/03	07.46	19.15	18/04	07.39	19.08	21/05	07.32	19.00
17/03	07.25	18.53	19/04	07.18	18.46	22/05	08.52	18.39
18/03	08.44	18.31	20/04	08.37	18.24	23/05	08.30	18.17
19/03	08.22	18.10	21/04	08.16	18.03	24/05	08.08	17.55
20/03	08.01	17.48	22/04	07.54	19.22	25/05	07.46	19.15
21/03	07.39	19.08	23/04	07.32	19.01	26/05	07.25	18.53
22/03	07.17	18.46	24/04	08.52	18.39	27/05	08.44	18.31
23/03	08.37	18.24	25/04	08.30	18.17	28/05	08.23	18.10
24/03	08.15	18.03	26/04	08.08	17.55	29/05	08.01	17.48
25/03	07.54	19.22	27/04	07.47	19.15	30/05	07.39	19.08
26/03	07.32	19.00	28/04	07.25	18.53	31/05	07.17	18.46
27/03	08.52	18.39	29/04	08.44	18.32	01/06	08.37	18.24
28/03	08.30	18.17	30/04	08.23	18.10	02/06	08.15	18.02
29/03	08.08	17.55	01/05	08.01	17.48	03/06	07.53	19.22
30/03	07.46	19.15	02/05	07.39	19.08	04/06	07.32	19.00
31/03	07.25	18.53	03/05	07.18	18.46	05/06	08.51	18.39
01/04	08.44	18.32	04/05	08.37	18.24	06/06	08.30	18.17
02/04	08.23	18.10	05/05	08.16	18.03	07/06	08.08	17.55
03/04	08.01	17.48	06/05	07.54	19.22	08/06	07.46	19.15
04/04	07.39	19.08	07/05	07.32	19.01	09/06	07.24	18.53
05/04	07.18	18.46	08/05	08.52	18.39	10/06	08.44	18.31
06/04	08.37	18.24	09/05	08.30	18.17	11/06	08.22	18.09
07/04	08.15	18.03	10/05	08.08	17.55	12/06	08.01	17.48
08/04	07.54	19.22	11/05	07.47	19.15	13/06	07.39	19.07
09/04	07.32	19.01	12/05	07.25	18.53	14/06	07.17	18.46
10/04	08.52	18.39	13/05	08.44	18.32	15/06	08.37	18.24
11/04	08.30	18.17	14/05	08.23	18.10	16/06	08.15	18.02
12/04	08.08	17.55	15/05	08.01	17.48	17/06	07.53	19.22
13/04	07.47	19.15	16/05	07.39	19.08	18/06	07.31	19.00
14/04	07.25	18.53	17/05	07.18	18.46	19/06	08.51	18.38
15/04	08.44	18.32	18/05	08.37	18.24	20/06	08.29	18.16

MORNING PASSES ARE SOUTHBOUND EVENING PASSES ARE NORTHBOUND







the Irish Sea but does it stop at the coast or extend inland? Contrast stretching by computer software, which means allocating a wide range of grey levels to a small range of greys on the original image, can sometimes make cloud edges more apparent but often it is impossible to distinguish cloud from land by looking at a single image.

Images in visible light will almost always distinguish cloud from land and sea but are not available at night. On visible images land and sea almost always appear very much darker than clouds. At night the NOAA satellites transmit a second IR picture in place of the visible image. Its wavelength is only 3.7 micrometres and is often better at delineating areas of low cloud.

On the 0700 image slight variations in colour are evident over France and central Europe. Are they due to cloud or variations in land temperature? Experience will answer this question. The lower temperatures of the main mountain areas make them conspicuous when cloud-free. Note the pale streak of the Pyrenees and the hook-shaped Alps.

On the higher resolution NOAA satellite images other geographical features will become familiar and not get confused with clouds. Obviously, if a feature moves in the interval between two images then it is cloud. By 1230 the land has warmed considerably except in the far north but cloud temperatures remain much the same resulting in a greatly increased temperature contrast between cloud and ground. The edge of the low cloud over Britain and Ireland is now clearly visible.

I have squeezed a lot into the above paragraphs. If you have understood it all you will have no difficulty in answering the following questions. The Chott el Djerid is a vast, shallow salt lake in Tunisia covering several hundred square kilometres. In most winters it fills with water but begins to dry up in Spring and is usually bone-dry by August. Will it appear darker, lighter or the same as the surrounding desert on both day and night IR images in both summer and winter? How will it appear on visible images in both summer and winter? Why not monitor images over the coming months and check your answers?

It is easily visible on Meteosat images but for most European members it is within range of the NOAA and Soviet METEOR satellites. If you use Soviet IR images then be warned! Black represents LOW and white represents HIGH temperatures!

BOOK REVIEW
Peter Green, G0ABI

'A VIEW FROM LOW ORBIT' by Tom Loebl

I first heard of 'A View From Low Orbit,' a photographic tour of North America and its weather from a review in WeatherSat Ink. I was intrigued by what Tom Glembocki said he could see in the photographs. There was a further review in the Earth magazine, which apart from interesting me further in this book, has some very good satellite images in it most months. So I sent off my money. It seemed almost by return the book was on my doorstep.

Well what a surprise, the photographs and production of the book are outstanding. For just $17 plus $6 pp this is amazing value. The book contains 124 black and white photographs. Tom has used little text, what there is, is informative to the layman and relevant. Apart from five of the images of the West Coast supplied by Tracy Lenocker and Ed Murashie, all were received by Tom at his home in Massachusetts.

The book is split into two parts. Part one is the geography of North America, part two is it's weather and clouds. There are no country, Lat/Long or other extraneous markings on these photographs, all you get is the unadulterated image. Tom starts with a short preface, giving an account of his progress so far. All the images are HRPT and are from NOAA 9,10,11,12 and Feng-Yun FY-1B. The book opens with an amazing image of Greenland, covered with ice and snow of course, but also showing sea ice and wind currents in the area. It also shows stratocumulus clouds in the surrounding North Atlantic and Labrador Sea.

The following pages give a few more images of Greenland and surrounding area in terrific detail. Image 13 is of the Gaspe Peninsular at the mouth of the St. Lawrence River. Lake Manicouagan is seen as a frozen circle, which is an ancient meteor crater and is about 35 miles in diameter. You can also see ice forming like strands of wispy smoke in the Gaspe Passage and the Gulf of St.Lawrence in this early spring morning image from NOAA 10.

There are so many superb photographs; to mention all here would take so long. The section on storms growing into hurricanes is really excellent. The book also has the effect of making you get the atlas out, and really look deeply at what the images are showing you of that particular area. My

knowledge of North American geography has certainly improved after reading this book.

If you would like proof before you purchase, avail yourself of the excellent RIG GIF library. Disk number 22 has five images that are in the book, you will see for yourself what the book promises. Tom Loebl is a member of RIG. I believe the board he uses to process the images is similar to the Timestep board. The software is written by Tom himself. He uses a 1.2 Meter dish. I must admit until seeing the images in this book I was a little sceptical as to the merits of HRPT.

Beware if you felt like I did then this book will convince you. The book is obtainable from:

Imaging Publications 53 Underwood Road, Hubbardston. MA 01452 U.S.A. No credit cards.

FOR SALE...

1.8m Solid Precision Spun Alloy Dish. Surface accuracy better than 0.5mm. Seated on a dual steel ring with alloy triple feed for KU, KA and L band LNA's. The dish is mounted on an equatorial mount for tracking the geostationary belt. Supplied with a 36" "Black Jack" linear actuator motor. (Reed relay type) and a Digital Huston Tracker motor driver. Pointing accuracy better than 0.3 degrees. This antennae has been used for the last two years for METEOSAT PDUS reception and 10-12 GHz Low Power TVRO reception. (Will demonstrate on collection). For sale complete as above. Buyer to collect and arrange delivery. first offer of £260.00 will secure.
Bob G4MWR York (0904) 425619

YU3 UMV single page frame store including a G8LOK sync board, PSU, and all construction notes. All installed in a small, quality, metal cabinet. My overseas posting forces sale. This deserves to go to a good home. Only 75 pounds. Post and packing at cost.
Contact Andy Emmerson G8PTH, 71 Falcutt Way, Northampton, NN2 8PH Tel: 0604 844130

THE GIF PICTURE LIBRARY

MIKE GOODALL

The following are available at present:

Disk 1 UK Noaa: in colour (x5)
Disk 2 UK Noaa: most in colour (x5)
Disk 3 Americas: various (x9)
Disk 4 Americas: various (x8)
Disk 5 Americas: various (x7)
Disk 6 Space: Spaceman, Launch, Mars, Venus, Saturn, Earth (x5)
Disk 7 Earth: various HRPT, plus GMS4 (x8)
Disk 8 Russian Meteor: Various (x5)
Disk 9 Various (x9)
Disk 10 Russian Meteor/Landsat: USA (x4)
Disk 11 AusGMS and Noaas (x4)
Disk 12 Mets and Noaas (x4)
Disk 13 HRPT: Italy and Greece by Marciano Righini (x6)
Disk 14 SW Pacific (x5)
Disk 15 HRPT (Peter Hayes article, RIG29) (x7)
Disk 16 APT, various (x3)
Disk 17 FengYun and Okean (x3)
Disk 18 HRPT: various by Marciano Righini (x9)
Disk 19 HRPT: various by Marciano Righini (x9)
Disk 20 HRPT: Set of 5 channel HRPT by Peter Hayes + Greenland (x6)
Disk 21 HRPT: various by Peter Hayes and Marciano Righini (x7)
Disk 22 HRPT: various by Tom Loebl (x5)
Disk 23 Space: Shuttle + Mars (x3)
Disk 24 APT of Arabia + PDUS Globe (x3)
Disk 25 PDUS: various by James Brown (x4)
Disk 26 Russian Mets: by Ulf Jander, converted from Amiga format (x14)
Disk 27 Russian Mets + Meteosat: Ulf Jander, converted from Amiga format (x12)
Disk 28 Okean: by Les Hamilton, converted from Archimedes format (x9)

SHAREWARE PROGRAMS... Viewing/tracking progs, etc. (zipped) *PC format Only!*

(Disk 99... VPIC v.5.0 (viewing program, GIF, RIX, PCX, etc.)
IMAGE PROCESS v.1.0 (GIF editing program)
PCTRACK v.1.1 (Satellite tracking program, simple to use)
GRAPHICS WORKSHOP v.6.0 (viewing/conv. for GIF, etc.)
NOATIF v.2.0 (converts .DAT .NOA and Raw data files to .TIF)

Disk 99A... PCTRACK v.2.1 (latest version, but more complicated to use)
EDSAT v.1.6 (program for manipulating NASA 2-line files)
ELEMENT MANAGER v.1.8 (management for 2-line and Amsat)
IMAGE DISPLAY v7.4 (viewing and manipulating program)
VGA CAPTURE v.8.0 (resident screen capture program)
COMPUSHOW v.8.41A (self-sizing viewing program)

Disk 99B... WINGIF (viewing program for GIF via Windows3 & 3.1)
PAINTSHOP (another viewing program - Windows3 & 3.1)
GEOCLOCK (Graphical map showing daylight areas, etc.)
LEARNORBIT (Teaching program about orbits)
WX v4.3 (Weather forecasting program)
GIFDOT2 (GIF printer routine for dot matrix printers)
JVFAX v5.0 (APT, FAX, WXFAX, etc. receiving program)

You will need a viewing program to see the GIF files; VPIC is recommended for starters. It is supplied on Disk 99 in zipped form. PKUNZIP is included on all the Shareware disks. To use zipped versions of any of the programs... make a directory or subdirectory on your hard disk, where you want the program to reside (i.e. C:\VPIC) and unzip it into the directory as follows:
PKUNZIP <filename.zip> <Hard drive letter:\directory or subdirectory>
(i.e. PKUNZIP VPIC50 C:\VPIC).
Next read the Doc and Readme files to enable you to configure it to suit your video card and machine. Remember that some of the images may lack contrast and brightness. As most of the files supplied are in their original form, 256 levels, you will probably have to use the contrast and brightness keys on your viewing program to set the levels to your own preference. This can make a world of difference to the finished picture. Remember that if you resave the GIF file after altering the brightness and/or contrast you will always loose some of the original data. This is our main reason for supplying most of them in their original form.

HOW TO GET YOUR COPIES...

UK MEMBERS:

WHAT TO SEND...
UP TO 6 FORMATTED BLANK DISKS for PC format 1.4Mb or 1.2Mb only
for Archimedes format 800kb only
IN A RESEALABLE PACKAGE (or a package within a package)
A SELF ADDRESSED STICKY LABEL
STAMPS FOR THE RETURN POSTAGE
STAMPS OR COINS TO THE VALUE OF £2.00
Send to Mike Goodall, 2 Meadow Court, Littleport, Ely, Cambs. CB6 1JW.

Note: six disks stuffed into an ordinary plain or buff 9" x 4" envelope is woefully inadequate, as the package is unlikely to reach its destination intact. Small Jiffy bags are ideal, as are the special Disk Mailers available from your local computer store. Please, no small Postal Orders or Cheques as the bank takes most of it as charges!

OVERSEAS MEMBERS: As above, but return post is free. No donation reqd.

IMPORTANT... **ANYONE NOT COMPLYING WITH THE SIMPLE RULES OF THE GIF LIBRARY ABOVE (i.e. FORGETTING THEIR DONATION OR SENDING UNFORMATTED OR WRONGLY FORMATTED DISKS) WILL HAVE THEIR DISKS RETURNED BLANK. * * * YOU HAVE BEEN WARNED! * * ***

Approximately 95% of the Members requesting disks comply with these simple rules, and due to the immense amount of time voluntarily given up to the Library, it is unfair of the remaining 5% to expect us to make special exceptions just for them.

Most Library disks have approx. 1.2Mb on them; the best format to send is 1.4Mb HD 3.5". 1.2Mb HD 5.25" are also acceptable. Sorry, because of technical problems 360kb and 720kb are no longer accepted for copying to. *Only legal PC formats please. No drilled out 720kb formatted to 1.44Mb or 360kb to 1.2Mb, etc.*

While we will take steps check master disks of GIF, Shareware and upgrades, RIG and it's officers will not be responsible for any virus damage caused.

GIF LIBRARY PICTURES FOR THE ARCHIMEDES

Les Hamilton

I recently received some discs from the GIF PICTURE LIBRARY from Mike Goodall with the intent of converting them into sprites for viewing on my Archimedes microcomputer. I must say that I was really pleased at how well my efforts turned out, particularly with the HRPT images (as there is no system available as far as I know for downloading HRPT directly via the Arc). When I told Mike how I had fared, he suggested that it might be an idea to convert the entire GIF library so that RIG Archimedes owners might have access to these images, some of which are absolutely stunning. So we are going to give it a go. We plan therefore, to make the GIF Image Library available on 3.5" 800k Archimedes discs. The images will mainly be in compressed format, but can be de-archived using the ArcFS utility (supplied on each disc). Each disc also contains a "ReadMe" application which gives full instructions on how to achieve the de-archiving. Note that some of the images are quite large, and will require a computer with at least 2Mb of RAM for de-archiving and viewing. For example, the Feng Yun sprite on Disc 17 occupies 769kb when de-compressed. Members with 1Mb machines should state this fact when ordering, and I will scale the images down for them.

Viewing Images...

No special additional software is needed to view these images. Every Archimedes comes with two applications which will do this very nicely, namely !Paint and !Draw. In each case, make sure that your computer is in a 256-colour mode, e.g. MODE 15 or MODE 20. Again, the "ReadMe" file on the disc tells how to do this. Another way of viewing the images is to use !Translatr, a shareware image processor mentioned by David Woods in RIG 31 (page 71). It can read in Archimedes sprite images (and, indeed, raw GIF files), and has the facility to re-scale them instantly in either the horizontal or vertical directions.

How to obtain Archimedes Images...

The "Rules" for Archimedes owners are identical with those for PC owners. The only difference is the address to which to send requests, which is:-

LES HAMILTON, 8 DEESIDE PLACE, ABERDEEN, AB1 7PW

Please send only 800kb 'E' formatted DS/DD discs. I use an old Archimedes 310, and cannot handle the high format 1.6Mb discs used by the more modern machines. (All machines can format to 800kb on DS/DD discs) **Note Library disk No. 26 will require two 800kb disks to get all the converted files on.**

Note: only the Picture Disks 1 to 28 are available for the Archimedes, the Shareware Disks 99 to 99B are for PC users only!

How is the transfer achieved?
For those members interested in such matters, or who may be interested in converting images directly for themselves; this is how it is done. GIF images on original 1.44 Mb GIF Library Discs are saved on to 720kb discs using a PC. The images are then transferred from the 720kb discs to Archimedes discs using the !MultiFS utility supplied with the Archimedes PC Emulator. This accomplished, !Translatr is used to read in each GIF image, and output it as an Archimedes sprite. If necessary, some of the larger images can be scaled down at this stage to make them more manageable in 1Mb Arcs.

I have also experimented with !ChangeFSI, another image processor recommended by David Woods, but, in my hands at any rate, !Translatr gives by far the better results.

Reversing the Process...
Noticing Mike's plea for interesting Polar Orbiter images, I have sent him a batch of Okean II images (visible, RADAR and microwave) which he has compiled into Disc No 28. These images were prepared from Archimedes Framestore files, first converting them into sprites with Spacetech's !SpriteSF utility, then using !Creator to convert them into GIF format. The final piece of the jig-saw, scaling them to view correctly on the PC, was done by Mike. Because the Archimedes 256-colour display modes only allow a grey-scale of 16 shades, these images necessarily lack the 'bite' of images produced directly on the PC. Nevertheless, they do give an excellent idea of what OKEAN II was capable of in its various imaging modes.

Future Possibilities
By the time this appears in print, I will be well into my apprenticeship as a PC operator. As I have several fine OKEAN passes preserved on magnetic tape, I will be producing images directly on the PC. If, as seems likely, these prove superior to converted images, it will be possible in time to upgrade some of the images on Disc 28.

Are there any good Arc Images out there?
Mike is always pleased to receive good images from Polar Orbiters, particularly the more unusual ones like Okean and Feng Yun, for possible inclusion in the GIF library.

The same obviously goes for Archimedes !Framestore images. If you have any really good satellite images in !Framestore format, please send them in. Not only can archived sets of sprites be prepared for viewing on Archimedes microcomputers, but they can be converted into GIF files, and made available to RIG members in general.

If you have any !Framestore discs which you think could fit into this category, please feel free to send a copy, in the first instance, to: L. Hamilton, 8 Deeside Place, Aberdeen, AB1 7PW, for evaluation.

THE SOVIET & CHINESE SCENE

PETER WAKELIN

To my surprise the active METEORs switched much as I predicted last time. 3-4 took over from 3-5 in early November but its IR sensor developed a problem as early as November 3 according to Geoff Perry. 3-3 precessed out of evening twilight and was switched on late in the month but it also suffered from IR problems. Normally the change from vis to IR is immediate but IR was coming on only very briefly and then only after an interval of several minutes following cessation of the visible transmission. The situation improved and eventually very good IR images were being transmitted but still with a gap of several minutes between visible and IR. The same thing happened on METEOR 3-2 three years ago but was eventually resolved.

With the sun so far south visible imagery has not been very exciting over Europe but I got some very good images of the snow-capped Atlas Mountains when METEOR 3-3 precessed under the mid-day sun in early January. Lighting is improving rapidly now and we can look forward to some good images in the coming months. METEOR 3-4 has just come back on and this will be well placed for visible imaging until early April. At the time of writing there is no IR but hopefully, this will come on.

I did think we might have seen something from METEOR 3-5 when it was well placed recently but it seems this one was launched primarily to get the Total Ozone Mapping Spectrometer (TOMS) into orbit to replace the ageing NIMBUS 7's TOMS. As long as the other two are serviceable and one or other of them is well placed then we may not hear much from METEOR 3-5.

Three people 'phoned me in December and January to say they had heard signals on 137.85 MHz during the evening when METEOR 3-3 was too far west. Unfortunately, none could provide times of the signals. However, I suspect that they did come from METEOR 3-3 when it was well north over the Arctic. Even when at its most northerly point above latitude 83 degrees (the same as its inclination to the equator) it can just creep above the horizon for British observers.

It is quite possible to get signals from the higher series 3 METEORS on 10 successive orbits from the first northbound pass above the eastern horizon to the last southbound pass in the west. If you find it difficult to visualise the motion of a satellite orbiting a rotating Earth and do not have a fancy

tracking programme then try this: Take a map of the northern hemisphere, preferably in polar stereographic projection, place upon it a transparent sheet and stick a pin through the north pole. Then draw a straight line tangential to the 83 degree latitude circle. Rotating the overlay in 27 degree increments of longitude (the Earth's rotation during one orbit of METEOR) will then show the satellite's approximate ground track on successive orbits. METEORs 2-19 and 2-20 have been silent for six months now and I am also unaware of any APT signals from the Chinese FENG YUN satellites.

FOR SALE...

AMIGASAT V.2.0 Weather satellite programme with interface and manual for AMIGA computer £90
Terry Barber Droitwich, Worcs. Tel: 0905 775206

FREE TO A GOOD HOME - Creed 444 Teleprinter with gearing for 50 or 45.5 (amateur) baud, plus paper punch tape and paper rolls, Very heavy, so if you want it, please collect.
BBC 'B' Computer with single 40 track Drive (No monitor) Fitted with technical Software Eprom and Interface, enabling reception and transmission of FAX and SSTV. £75
W.A. Wilkinson Kendal, Cumbria. Tel: 0539 726406

Muirhead K401 paper-roll Facsimile modified for weather satellite picture reproduction. 240v mains. Nice condition. Extras include: some paper rolls but condition not certain; technical information and circuits; spare helix styli; associated helix fax transmitter; crystal controlled ac power supply unit; auto switching unit. Prefer buyer inspects and collects, otherwise add cost of carriage. Well worth £40.

Parabolic dish with 1.69GHz Meteosat feed horn. Home constructed of thin aluminium petals bolted together and mounted on a wooden tripod. Portable, lightweight and functional. Used successfully for METEOSAT reception. 1.2m diameter, 0.18m depth, focal length approx 0.5m, gain about 25db. Petals can be dismantled for transport, i.e. 150 small nuts and bolts. Buyer to collect and dismantle if needs be. Bargain at £10.
E. Chicken MBE, 21 Townsend Cresc., Kirkill, Morpeth, Northumberland NE61 2XP. Tel: 0670 513994

WORLD WATCH

DAVE CAWLEY

This feature is intended to keep readers abreast of satellite sleuthing in the rest of the World. This first attempt is more of an introduction to the U.S.A. and Australia. I envisage future issues to have about 400 words per area, giving status of satellites, their performance and a general feel for what's happening. I would welcome inputs from Eastern and Western Europe, The Soviet Union, Africa, South America, Japan and any other areas. It is not intended to be a political or an overt selling platform!
Please FAX your copy to Dave Cawley +44 440 820281 or upload ASCI text files on +44 440 820002. Handwritten communication is by its nature too slow and not suitable.

Stephen Padar starts this new column and revives HRPT and PDUS in Florida. He has written articles in most Weather Satellite publications including RIG, we hope to see Stephen as a guest at the RIG Conference. Stephen supplied the image data from his HRPT system for the cover of RIG 31.

Report From North America
Stephen C. Padar

I have been active in this hobby for the past 13 years and watched it evolve at an ever increasing pace. This was made possible by the increasing power, speed and sophistication of the IBM clone personal computer, coupled with a sharp decline in its price. This allowed the average person interested in weather satellites to participate in this fascinating pursuit. I am a practising Neurosurgeon and do not have the skills and knowledge to develop the hardware and software tools to further the hobby, but feel fortunate to know others such as John Du Bois, Tracy Lenocker, Ed Murashie, George Islieb, Dave Cawley and Marciano Righini who have the engineering training and interest to achieve revolutionary advances in the hobby. They have also had the foresight to develop these products at reasonable prices that many of us can afford. It would benefit us little to produce great products at the cost of thousands of dollars. After all, this is still a hobby and the money to fund it has to come out of the household budget.

The North American weather satellite amateurs meet yearly at the Dayton Hamfest. This is the largest gathering of radio amateurs in the world. This year, it will be held at the Hara Arena in Dayton on April 23-25. The weather satellite amateurs usually stay at the Holiday Inn in Fairborne, OH, a suburb of Dayton. On Saturday April 24 there will be a weather satellite forum when the leaders of the hobby make their formal presentations on the latest developments. These are also additional meetings and presentations at the Holiday Inn during the weekend, and also many informal discussions held in various rooms at the inn. The Hamfest, itself, is fascinating with most of the major manufacturers of amateur radio equipment presenting their latest creations. There are also hundreds of vendors of computers, radio receivers, antennas, cables and thousands of other items. Also represented, of course are the vendors off weather satellite equipment. You can see the equipment functioning and ask the manufacturers questions. You can even buy the products on the spot or order for late delivery. In addition there are hundreds of flea market stalls that sell everything from junk to real bargains.

Dayton is home to Wright Patterson Air Force Base, one of the largest air bases in the US, and has the greatest and best Air Force museum in the US. On exhibit are a replica of the Wright Brothers Airplane, B1 bomber, and many other items relating to aviation and space exploration.

The past year has been full of weather satellite activity, with Hurricane Andrew providing dramatic images. Most weather satellite amateurs are receiving APT images from the NOAA and Meteor satellites. Many are also receiving WEFAX images from the GOES or Meteosat 3 satellites. Meteosat 3 also transmits 2.5km resolution images including visible, IR and water vapour images. These are updated every 30 minutes and are valuable for monitoring the movement of weather fronts. A reasonably priced receiving system, available from Timestep, has made this possible.

A few amateurs are receiving HRPT images. These are 1.1km resolution images, consisting of 5 spectral bands including visible and various IR bands. One needs an IBM type computer with a relatively fast hard drive with a large capacity. A full pass with all 5 bands saved can occupy 72Mb of disc space. Frequently, tracking is automated with the aid of a second computer.

Reception of VISSR images, the .8km resolution images from the GOES satellites, has proven elusive. There are very few amateurs who have home built systems for this mode of reception. Commercial boards have been

promised but so far have not materialised. *[Spacetech and Timestep now offer suitable wideband receivers giving high signal-to-noise on a 90cm dish, Mike].*

There are two weather satellite electronic bulletin boards for amateurs: Datalink BB in Dallas, TX 1-214-394-7438 and the Kelso Bulletin Board in Dayton, OH 1-513-427-0674. Both of these have Keplerian elements for weather and other satellites that can be downloaded into a computer. The two Journals dealing with weather satellite related news are:

Weather Satellite Report
PO Box 17108
Fountain Hills, AZ 85269-7108

WeatherSat Ink
4821 Jessie Drive
Apex, NC 27502

If after reading the above Dayton appeals to you, why not go ? It's very simple although at this time of year booking a hotel is going to be near or absolutely impossible. If you want to go next year with a RIG party, drop Dave Cawley a line.

Gerald Sargent lives in what appears to be the focus of activities in Brisbane Australia, he has receiving capability for HRPT and PDUS (PDUS for his trips outside of Australia!). Gerald, if we are lucky might be able to make the RIG Conference.

Report from the Antipodes
Gerald E. G. Sargent

What is Available: APT orbits appear designed to service the Northern Hemisphere. Just now NOAA APT's crowd the hours of darkness with some orbits in early morning or late afternoon. Meteor APT's tend to favour the daylight hours.

GMS is the only visible geostationary w'sat, 1.691GHz, bandwidth of 250 KHz, equatorially at 140 degrees E. A GOES at a few degrees above the eastern horizon is virtually unreadable.

A hemispheric view extending from roughly 60 degrees E eastward to roughly 165 degrees W is what GMS "sees", most of the Indian Ocean and the Western Pacific to the Hawaiian Islands. N & S the cut off is roughly 60 degrees. Each 3 hours GMS transmits processed IR data of the whole hemisphere in 4 quadrants, A to D. Hourly two processed images, IR and VS

or enhanced IR, of the Japan/China sea area are likewise available. Daily at 0110 - 0115 UTC the week's timetable (MANAM) is transmitted. Sundays a test card replaces Manam.

Distribution of Weather Satellite Enthusiasts: (WSE's) A quick phone round to Australian Manufacturers reveals some 300-500 WSE's in Australia and possibly some 50-80 in New Zealand. In Australia Brisbane is the centre of activity with about 55% of total in the States of Queensland and New South Wales, spreading S and E around the populated areas. Much (isolated) interest too is shown by folk in the "outback" farming and mining areas. At this juncture little is known about WSE's in Indonesia, SE asia and Japan. It is suspected, from manufacturer's data, that with the (probable) exception of Japan, there is very little activity. A notable exception being Australian enthusiast, Chris Van Lint, our HRPT guru. Previously in Seoul, Korea, he is now in Hong Kong. We wish him well in solving his antenna problems and look forward to again receiving (copies of) some of his spectacular imagery.

Antennas used: There are two main types of WSE, those "with" and those "without" tracking systems. Probable (RHCP) crossed dipoles were the first used. Later a "J" pole was recommended by one rx kit supplier.

Recently (E.A, Feb/92 & WeatherSat Ink, Summer 92, centre page) we have been reminded of the merits of the (RHCP) Lindenblad, and these are rapidly being recognised as the best. Highly sensitive at low angles, WSE's with interference problems may be better off with the "deaf at low angle" crossed dipoles. I have both, and a toggle switch to select, by the RX.

Users of the Oscar's find that tracking 2m arrays produce results on the APT's horizon to horizon noise free pictures being the norm. Readers may not fully appreciate that a complete APT image will just overstep Australia, we do not enjoy the variety of geography seen by European WSE's. Those along the south coast of Australia can receive the coastline of Antarctica.

For the vertically polarised GMS at 1.691 GHz I use two 44 element loop yagi (here inclined anticlockwise by 28 degrees) via a power splitter directly into a Timestep LNA. One will give a noise free picture. I find the loop yagis better than a 1.5m dish, being less directive, and less prone to "fly" in high winds.

There is a known HRPT user (loop yagis) in NZ and at least one dish tracking HRPT system south of here. I have a 0.9m dish, and a near

complete 5 degree x 36 degree fan shaped beam 8 x 12 turn linear aimed, but not tracking, HRPT reception.

Interference: Power line and/or computer generated interference is the commonest problem. The increasing density of phone and pager repeaters Australia wide, will surely join the list. In Brisbane Ch2 and Ch9 TV mix to give 137.5 MHz intermodulation (we have 6 channels, 5 normal plus 1 Amateur repeater), other FM stations give trouble 137.8-85 MHz.

Signals from the north tend to suffer from the ubiquitous e-m interference accompanying equatorial meteorological activity. At low angles the "Polaroid effect" is itself as alternating bands of noise then clean signal being worst at extreme ranges. I am advised, but have not experienced it, that inversion, RHCP to LHCP can also occur. I have no reports of interference at 1.7 GHz.

Receivers: Low cost receivers and various scanners are the entry point for many. APT WS imagery encourages better installations. Specific receivers/kits from Germany, USA and UK compete with local suppliers. Many kits never reach their design potential. Access to Signal generators, Spectrum Analyzers and Sinad Meters is essential for optimal alignment, but clearly many achieve acceptable results without them.

GMS, with 260 KHz bandwidth, requires a special FM receiver. Down-converters are aplenty. A Brisbane source makes a good receiver that can be adjusted to accommodate imported down-converters (o/p 134 MHz at 1.691 GHz., xtals are costly here). The same source can supply down converters, LNA's and AE/dishes.

Presently HRPT equipment has to be imported.

Preamps: This subject can be controversial. Presently I favour the use of a preamp as close to the AE as possible, powered up the coax. There are good ones and bad ones. At 137-8 MHz it is difficult to go wrong.

I have tried various 1.7 GHz LNA's. At this time the Timestep unit familiar to RIG readers is in my opinion the best buy. One local WSE has his home brew 1.7 GHz LNA on epoxy glass exposed to the elements.

When rain affects the performance he gives it a squirt of RP7 (water dispersant). Exposed to sun and rain it works beautifully. Like water diviners, some have the gift.

PC's: The local MicroBees, Tandy Coco's and Commodore 64's still slog on, and through a plethora of Z80/8086 machines the IBM "clone" is seen as the ubiquitous device. Amiga's and Mac's have their cult following.

XT's are almost fossil, AT's are usually noisy, as are some 386's. I've heard no bad reports of 486's yet.

Clone suppliers here deliver to both German/Swedish and FCC (USA) e-m specifications. Only the former can be considered effective as seen from here. I find the battery driven Standard AX700 panoramic receiver ideal for "sleuthing" noisy devices before purchase, having experienced two emi generating AT's.

PC Interfaces: Several Australian made devices from Communication/Games port entry through to plug in (IBM) a/d cards incorporating excellent filters are available. Individuals also import kits/units from USA/UK. However, Duty here can be 70%.

Software: There are a few Australian packages, with one outstanding package. I use both a PROsat II and this local programme, each having some advantage over the other. Where noise is prevalent the local product offers some advantages, line synchronisation and playback of noisy tapes being independent of signal quality.

The Future: Hopefully the proposed geostationary WS over the Indian Ocean will materialise, and if one could be set over the mid Pacific would fill a major void.

It would be of great benefit to global meteorological studies if protocols could be agreed, and implemented, for Geostationary WS's to re-transmit some data from other parts of the globe. Access to Landsat and Spot is not that easy. However, following their successes with HRPT and PDUS it is to be hoped that access to those APT high resolution Landsat/Spot devices will soon be on the agenda of "you know who".

General: Whilst we do not have "ex-military" surplus suppliers to glean, my frequent trips to the land of my origins (UK) reveal that as well as RS and Farnell, we do have many component shops that are a joy to peruse, such as no longer exist in Europe. What we cannot get off the shelf is readily obtained by air-mail from USA/UK. We have excellent mail order too. In this context, suppliers please note: If you don't take plastic money you probably will not get an order. FAX is commoner here than in UK.

In Conclusion: With the advent of KITSAT, and all that it implies, PLEASE, you unlicensed chaps, get your VHF call and use it, THEN lobby the RSGB/ARRL/WIA etc for the abolition of morse before we lose, forever the exclusive use of the Amateur Spectrum. The Military and Commerce want us out. They are already poaching on the few frequencies left for us and real space research. My generation will, quite rightly, be cursed to eternity by the Amateur Fraternity of the future for our bigoted refusal to recognise, nurture and encourage the incredible talent amongst our young, excluding them from properly exploiting their potential by means of this antiquated "admission ritual" that few full calls can now exercise - or in many cases even remember.

Gerald E G Sargent. Professor Emeritus. VK4ZSG/G8CUV

METEOSAT INFORMATION...

Meteosat4 is currently serving the UK, Europe and Africa and is situated due South (180 degrees on the compass) at an elevation (for central Britain) of 30 degrees. Two channels are being used; Ch.1 (1691 MHz) for normal pictures, and Ch.2 (1694.5 MHz) for retransmitting some of the USA and South America pictures, originally from Meteosat3.

Meteosat3 is now serving Canada, USA and South America, and is situated at 50 degrees West (240 degrees on the compass heading for Central Britain, at an elevation of around 14 degrees). Only Ch.1 (1691 MHz) in operation at present.

Meteosat5 is situated very close to Meteosat4 and is being used for tests. This satellite can often produce interference on Meteosat4 pictures, producing patterning, etc.

The GOES and GMS satellites are not visible from Britain, as both are below the horizon.

KEPLER ELEMENTS

SIMON GOODALL

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NOAA9              137.62MHz
1 15427U           93020.56094524 0.00000144                    2763
2 15427  99.1214  58.0614 0014375 222.7185 137.2890 14.13476650417928
NOAA10             137.50MHz
1 16969U           93020.73549632 0.00000157                    1245
2 16969  98.5248  40.0731 0013944  29.6467 330.5488 14.24756021329635
NOAA11             137.62MHz
1 19531U           93020.86793058 0.00000304                     298
2 19531  99.1132 353.8960 0012246 129.7828 230.4416 14.12814614222875
NOAA12             137.50MHz
1 21263U           93020.78043551 0.00000228                    4817
2 21263  98.6742  53.4067 0012215 283.0145  76.9663 14.22187708 87698
MET3-2
1 19336U           93017.91798145 0.00000043                     172
2 19336  82.5511 328.2883 0018112 107.3503 252.9638 13.16954563215435
MET3-3             Last heard on 137.85MHz
1 20305U           93020.09109621 0.00000043                    6927
2 20305  82.5589 269.3516 0017526 121.3565 238.9281 13.16009194155621
MET3-4             Last heard on 137.30MHz
1 21232U           93010.99276195 0.00000044                    3441
2 21232  82.5434 178.8808 0018695  62.6945 297.6078 13.16815399 82633
MET3-5
1 21655U           93015.47888673 0.00000043                    3920
2 21655  82.5542 122.3715 0014527  52.8262 307.4185 13.16813951 68327
MET2-17
1 18820U           93021.21307832 0.00000070                    8499
2 18820  82.5420 315.8183 0015551 177.2153 182.9098 13.84669459251509
MET2-18
1 19851U           93011.52641567 0.00000065                    7924
2 19851  82.5195 199.8019 0013411 251.5302 108.4399 13.84316424195512
MET2-19            Last heard on 137.85MHz
1 20670U           93020.65406890 0.00000057                    5421
2 20670  82.5461 255.5572 0016355 141.9113 218.3205 13.84158111129718
MET2-20
1 20826U           93011.53490329 0.00000069                    5424
2 20826  82.5248 201.0042 0014360  69.2765 290.9929 13.83529972115621
FY1-2
1 20788U           93021.95710410 0.00000369                    5056
2 20788  98.8769  52.4153 0014224 359.8404   0.2733 14.01275495122109
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(No excuses for listing all the Mets as we cannot tell which will be on!) The frequencies shown are the last frequencies the Russian satellites were heard on. NOAAs do not change frequency.

An explanation of the 2-line format for those who wish to convert or update their Amsat format files... In order, the blocks of data represent the following...

Line 1 : NORAD sat.number - Epoch date - Decay Rate - Checksum

Line 2 : NORAD sat.number - Inclination - Right Ascension - Eccentricity - Arg.of Perigee - Mean Anomaly - Mean Motion (8 decimal places) - Revolution No. - Checksum (1 digit)

(Note: The Eccentricity has a leading decimal place which is not shown but assumed.)

GLOSSARY FOR BEGINNERS

APT - Automatic Picture Transmission (the standard relatively low resolution images received from Meteosat, Russian Meteor and Noaa satellites). In analogue form 1 to 2 lines per second.

COAX - The screened cable used to connect receivers, LNAs, downconverters.

DISH - A Metal or coated fibreglass dish (similar to those used for Astra (SKY, BSB) television systems), used for Meteosat, HRPT and PDUS remote imaging reception.

DOWNCONVERTER - A receiver unit that converts signals (from Meteosat for example) around 1600MHz to 137.5 MHz for use with a satellite receiver.

FEEDHORN - A feed unit that is situated at the focal point of a dish; collects the signal and passes it to a downconverter or LNA.

FRAMESTORE - A computer like device, containing and interface between the audio signal (from the receiver) and some memory chips which produces a weather picture on a TV or video monitor.

GEOSTATIONARY - (also known as Geosynchronous) Satellites that orbit the Earth (around the Equator) at the same rate as it rotates, making them appear to be constantly over the same place on the Earth. Meteosat, Goes, etc.

GIF PICTURES - Computer files, normally of weather satellite images, which can be displayed as pictures on a computer screen.

HRPT - High Resolution Picture Transmissions (received from Noaa Polar Orbiters in fast Digital Data form).

INTERFACE PCB - A computer board that interfaces the receiver to the computer. With software, reproduces satellite images on the screen.

KEPLERS - The data that enables us to find out where a polar orbiter is over the Earth, at any given time. Usually in Amsat or 2-line format (as in the Kepler page).

LNA - Low Noise Amplifier. Fitted at the feed of a dish or Yagi to obtain the best signal to noise as possible. Output goes to a downconverter.

NOISE FIGURE - The relationship between the received signal and the background noise. The lower the figure, the better.

PDUS - Primary Data User Service (received from Meteosat in fast Digital Data form).

POLAR ORBITERS - Satellites which orbit the Earth approximately from pole to pole, and take around 100 minutes per orbit. Russian Meteors, Noaas, etc.

SCANNING RECEIVER - A weather satellite receiver which scans the frequencies between 136 and 138MHz, or several preset frequencies in that range. Normally has a squelch control to lock receiver frequency when a signal is heard.

SHAREWARE - Computer programs, usually to display GIF or other format picture files, or calculate orbit predictions. You try the software first, and if you wish to regularly use it, you send a small sum to the author.

TRACKING PROGRAM - A computer program to display the orbits of the satellites as they cross the globe.

TURNSTILE - An aerial for the 137MHz band consisting of cross dipole, with another similar arrangement of elements mounted below.

UOSAT - A range of Amateur satellites, run by AMSAT, some which produce remote imaging weather pictures. (Also known as OSCARS).

UPGRADES (UPDATES) - New versions of computer programs, written to enhance or add features; supplied by the authors of the original software.

VHF PREAMP - A preamp fitted to a 137MHZ antenna to boost the signal. Output goes to a scanning or fixed receiver.

WEFAX - The name given to weather pictures from Polar orbiters, etc.

YAGI - An antenna for around 1600MHz (Meteosat, Goes, etc.) normally consisting of 30 or more small elements mounted on an 7ft boom. (Loop Yagis have small rings as elements).

SHAREWARE CORNER

MIKE GOODALL

NOATIF v.2.0

A useful program sent in by one of our Italian members, Paolo Cerretti, for all users of the Timestep packages, such as Prosatll, Pcsat3 and also the Microwave Modules package PCwSAT3. It converts the .DAT, .NOA and Raw Data files (up to 2400 lines long) into .TIF files. TIF files are better than GIF ones in the respect that no information is lost in the conversion program. But, they take up more space, as they are not compressed like GIF ones. Unfortunately, you cannot copy the colour palette with the file. So the old way of converting into RIX format (.SCF, SCO, etc.) with FCONVERT could still be useful for colour images. The screensave functions of the Timestep packages, as well as the VGACAPTURE programs will still do colour conversions if required. The .DAT format is converted into a 640 wide by 800 deep TIF format (which is the original pixel size of the .DAT file, but for better viewing you can resize the TIF file with another program such as Paintshop (the Windows viewing program on Disk 99B) to 800 x 800 which is the original square picture transmitted by Meteosat. The .NOA format is converted into a 1200 wide format. Read the small DOC file before using. When you run the program for the fist time it will create a .CFG file which will contain the information as to where the files you are working with are stored, i.e. C:\vgasat4\, together with the correct file extensions, .DAT, .NOA, etc. When you have configured it, exit to Dos and rerun. This time you will be presented with a Menu page which will allow you to search your directories for the files you wish to select. A return on the correct file will convert it to .TIF and save this new file in the same directory as the .DAT, etc. Many thanks to Paolo for writing this useful program and making it available free to other members. *On Disk 99*

COMPUSHOW v.8.41A

Yet another viewing program for GIF files, etc. It cleverly selects your correct video card and automatically sizes your picture file. Just load the file "CSHOWA.EXE" into a directory called "CSHOW" and execute. It self expands. To execute the main program just type "CSHOW". There's even a file for deleting all the video drivers that are unwanted. Most video cards are catered for, but SVGA users remember to execute the program with '+s' parameters. The options for your own SVGA card (Return) will give better resolutions than the default (space). Read all Doc files! *On Disk99A*

MEMBERS' LETTERS

[Any letters sent to the Editor, Make-up Editor or Committee are assumed to be available for publishing in the Newsletter, unless otherwise specified.]

Dear James,

After reading everybody's letters in the RIG Journal I thought it about time I contributed some waffle, so here it is.

A few years ago I was quite happy receiving APT on my Martelec MSR20, recording it on my Lo-Fi tape deck and decoding the images on my BBC Micro. I remember the first image building up on screen in glorious false 8 colour! This worked fine in Germany and Lincolnshire, although I did experience problems with the local HAM group whilst living on the Fens. Dare I say a word against this enthusiastic group on their own home ground? Yes, but not the one I used at the time. My unusual hobby was greeted with interest and facilities generously offered. The new purchase of an Archimedes and Spacetech Podule boosted my enthusiasm to even higher planes but was irritated by one small niggle. The HAMs were using 100W on HF and the only available space to mount my Turnstile Antenna was on their Aerial roof. Even when I wasn't there, their transmissions would generate a strong enough field to power up the Head-Amp and blow the FET. I didn't mind the cost of the FETs but what annoyed me was having to borrow a ladder and haul it and myself up two roofs to get at the melted parts. I bet Henry never had this problem.

Two years ago my work brought me down to Chippenham and into serious paging country. A mere three miles from the M4 is not what I'd call a radio dead-spot. The trusty old MSR20 immediately began to suffer tone burst fits and to inform me of the local Police Station's duty rota; not to mention which taxi was back on the rank at the Railway Station. The joy of being involved in local life was tempered only by my total ignorance of the APT scene. Such is life, I hear; but it just had to change. After nearly two years of experimenting, and hanging on, waiting for Martelec to aid my distress, I decided enough was enough. My Girlfriend was, at that time, a Field Service Engineer with a Paging company and I was kept abreast of events in that field. I even tried to get an APT fix by using her Motorola

Communications Analyzer, but the bandwidth wasn't wide enough. Of great concern was the accumulating knowledge of Pager frequencies and output powers. In this area these transmissions are to be found on 138.175Mhz, 138.025Mhz and, (how did they get the licence for this one) 137.975Mhz. Whilst using the Analyzer I found NOAA10 and 12's frequency of 137.5Mhz to be affected by a strong pager-type signal on about 137.440Mhz. This was rumoured to emanate from Hutchison Telecoms Ambulance Station based transmitter just down the road. Who's paranoid? With Christmas coming it was time for a bit of quick negotiating with the Girlfriend, and voila! Good old Santa turns up with a RIG Proscan receiver.

Instant improvement, though I still find NOAA10 and 12 unusable. A small price to pay for the luxury of noise free reception from NOAA9, 11 and (currently) MET3-3. The tape deck has always been used to record passes whilst Archie was switched off (RFI you know). During the few days since Christmas good IR images have been received most nights, but all have suffered what can only be described as brightness fluctuations. Suspecting the tape deck I tried putting a NOAA pass straight into Archie without using tape. The RFI problem was tackled by adding a mains filter to Archie and a military audio line filter between the rx and Archie and things improved a little. Disconnect the keyboard and things improved even more. Then the tape deck fell off the table, taking a rats nest of wiring with it, and things got a lot worse. So now cabling is sellotaped to walls, wiring wrapped around tools which are doing impressions of ferrite beads, and I'm getting noise free pictures. Just don't walk around the room while its decoding.

Now, where was that RIG article about curing RFI from an Archimedes.... A quick note about the equipment abused in this set up may be of use to somebody (?). First, there's the RIG/Timestep Proscan receiver which I think was excellent value. Then the Archimedes A310 with a Spacetech Podule with 4Mb RAM and a 100Mb SCSI drive. I'm still getting to grips with all the features available in the Podule! The PC Emulator is used in conjunction with John Kortink's excellent !Creator utility to put nice APT Windows backdrops onto PCs.

A Martelec Turnstile antenna takes up half the loft with a vertical cable run of about 13 metres. For hard copy I was fortunate to get a bargain on a HP Deskjet 500 printer which I can strongly recommend. Sat predictions are courtesy of Satfoot and Les Hamilton's !SatProg programs for the Arc, both of which are invaluable. The most useful piece of equipment over the years has been the RIG newsletter and this continues to be the only contact with like minded insomniacs who can't get rid of that ringing in their ears.

If any RIG member wants to talk about Archie's approach to APT or about radio problems in general I'd be pleased to, on 0249 652194. Try anytime as I work shift, and am as likely to be there as not.

And so to thank all the RIG members for a great Journal and wish everybody involved with these orbiting bleepers a prosperous and noise free New Year.

Damian O'Hara, Chippenham.

We have received a long letter from Fred Pieters in Belgium, and he invited us to use whatever parts of it were deemed to be helpful. He mentions firstly that he has been a member of RIG for just three years and has a number of RIG related weather products, mostly of Timestep manufacture. The rest of his letter relates to his experiences and suggestions in using this equipment. The original letter would probably have run to more than 6 pages in our journal, but there may be others who can benefit or help in Mr Pieters search for improvements, so we are publishing the main points. Dave Cawley was invited to answer some of the technical points, and his replies are inserted in italics.

Fred writes...

Mr Henry Neale insisted strongly that there should be a galvanic separation between the receiver inputs, and that there should be no connection between the receiver and the PC card, maybe because of a DC voltage at the input of the Prosat card. Of course, one could not use the +12v DC input from the computer any more, which anyway is noisy and sometimes inadequate, i.e., with a fully equipped motherboard with a maths Co-processor. I used two small Radio Shack Cat #273-1374 1:1 600ohm telephone isolation transformers, which I built into the Prosat II card. This involved modifying the DB-9 connector and making pin 1 Case ground, and pin 2 Signal ground. Of course a 10k ohm transformer would have been better, as the output impedance from the receivers is 10k, but I could find none. Could Timestep provide us some? If Timestep would make a new interface PC-card with the isolation transformers fitted, I would be interested in exchanging my PC card for a new one.
Audio transformers will not stop the passage of RF interference from the computer to the receiver. The capacitance from input to output is sufficient to allow the passage of interference almost unhindered. If this appears to be the problem then a low pass filter in both audio and screen cables should

be constructed. However in most cases if a suitable antenna and preamplifier is used it should mask direct (if any) interference.

I found that the speaker output of the Prosat II card produced a hum in the speaker: a series capacitor of 100nf in the speaker line eliminated the DC component and solved the problem.
Of course a 100nf capacitor will kill 50Hz hum. However this is bolting the stable door after the horse has gone. There would appear to be a power supply problem on Fred's computer. This should be urgently attended to before it's too late!

I then wanted to switch Channel 1 and 2 of my VHF Communications 1700mHz down convertor from within the VGASAT programme (Options, Channel 1, Channel 2) via pin 8 of the D9 connector on the card (active low if channel 2 selected). Direct steering of the relay did not work: high was 12v and low was 6.6 volts, so that the relay wouldn't open. I am still experimenting with an indirect steering of the relay via a transistor and a series 7.1v zener diode. Here a schematic diagram of the card would help a lot. This afternoon, while experimenting with a series resistor of 6.8k, I found that changing the channel in the programme either way produced 0 volts on each channel. I suppose that one of the ports had ceased functioning; could it be the 74HCT125? Formerly I had a Digisat PC card with two user settable addresses 300H and 310H, but the PC card was 'lost' when sent back from repair by COMSAT from Velp in Holland, who formerly distributed the hardware and programme. So I cannot make further comparisons regarding the evolution of the software. I prefer repairing the card myself, keeping in mind the experience I had with some obscure Dutch salesman who first pretended the Digisat card was sent back, but was left at the post office, then that the card was lost by the post office, then an employee said she forgot to send it back and afterwards it was lost again by the post office (sic!). I trust the British a lot more than I do the Dutch, so please could you indicate what to do?
The channel switching is open collector TTL, as can easily be seen by tracing the track back to the chip. It is specifically only applicable to the Timestep receiver as the supplied manual warns. A schematic will not help here, but a TTL data book would. Since the output that has been "blown up" clearly goes directly and only to the 74HCT125 this is clearly the component to change.

With regard to updating the elements in TRACK 2, for NOAA and FY-1B, the number of revolutions is sometimes saved in the file, sometimes not.
Track II comes with 3 pages of printed documentation and has context

sensitive help by pressing the industry standard f1 key, additional help is available by clicking on the red arrow on the text box. To determine if the element data is correct simply re-export the data into AMSAT format and check it by eye. We cannot see why this should be necessary though, it makes extra work with no benefit. Users of all tracking software are advised to call the Timestep or RIG bulletin boards and download elements directly. If the UPDATE option is used inside TRACK II then the NOAA reception program is also updated. This really is a very simple process, dial Timestep or RIG BBS, load the data into TRACK II and that's it. Just two operations and no laborious checking ! The number of revolutions is saved if PROsat is updated separately, but not if TRACK II is updated. However as this parameter is not used or important this is not considered a problem.

I would be very interested to know the address of the card in order to organise my PC. I have a 486 clone with Sound Blaster card, 2 serial and 1 parallel port, a Colorado Tape Streamer and a Chinon Flatbed scanner, all of which occupy addresses and can make for address and interrupts and DMA conflicts.
The PROsat II card uses address H310 & H311 together with DMA3. If the scanner DMA is relocated it should cure any conflicts.

I find it a pity that the SNOISE and LEVEL programmes are not integrated into the software menu. Regarding the menu: installation puts a lot of batch files in the root directory of, say drive C. I use a special Batch directory, but putting the batch files in this directory, which is, of course, included in the PATH statement, produces weird results, some of the programmes simply won't run in this way. Is there no other possibility than painfully editing every file?
LEVEL is to set up the card once. SNOISE can be used to make periodic checks on the system, But as the requirement to use them is very infrequent the menu does not call them. If they are put in the DOS directory they can be called at any time directly from the root directory if ever needed again. It is not necessary to edit files, simply follow the installation instructions. The root directory is the sensible location for batch files.

I found it a pity the receivers were produced with, in my point of view, the suspect F connectors. I changed them to the good old N connectors and discarded the now unnecessary adaptors and here the signal went up by at least 1db, which meant no more noise in the white of METEOSAT images. I rebuilt my Proscan receiver into a full metal case after trying to eliminate the computer IF interference by painting the interior of the case with conductive paint and the computer IF interference went down. I think a full

metal case is a must for weather satellite small signal receivers. You must understand that all our receivers are working in a fairly noisy environment with a nearby PC producing square waves. A calibrated S-meter on the receiver could do miracles in adjusting the aerials and down convertors. It was a very good idea to scan by crystals and not a free running oscillator. I found it a good idea to feed the down convertors and/or pre-amps via an interior connection in the receiver, eliminating the need to introduce an insertion loss of at least 1 db by inserting a DC feeder, but unfortunately the insertion of a series resistor produced only 8.8v at the pre-amp and the pre-amp stabiliser of course did not work any more producing a small ripple. I replaced the resistor by a RF coil from the 12v input of the receiver to the antenna input, of course isolating the receiver input from the 12v, and up went the signal and down went the noise.

F connectors are certainly not suspect, they work very well and have long term reliability. If Fred experienced a change from noisy to noise free images, by apparently gaining 1dB from the 137MHz chain, then there something seriously wrong with his equipment. We suggest that if Fred had used F connectors instead of a foot of adaptors the results would have been perfect. The computer interference will come down from the antenna or via the computer/receiver cable. Screening the receiver will not help. In any case each and every RF inductor in the PROscan Receiver is individually screened and a top and bottom ground plane has been used. I think Fred has misunderstood the whole concept of computer related interference. Antennas and properly designed down-convertors do not need any user adjustments, so instead of fitting a S meter on the front panel, we actually marked the crystal positions with frequency so that the satellite can instantly be recognised. Geostationary satellites are best set up by a spirit level and then a 30 degree inclination for METEOSAT 4. For azimuth, mark on the ground the limits either way where the signal can no longer be heard, and the best signal strength will be mid-way between the two. Timestep products work perfectly from the built in power feed. We simply cannot condone modifying our products to work with others.

So you see; this is why an amateur needs schematics, not for illegally reproducing receivers and/or PC boards.

We do not provide schematics for various reasons. We believe that with the technology involved it is not possible for the average enthusiast to improve our designs. Fred is incorrect about copying, the only copying we have had is at amateur level.

Really, one A4 page for the NOAA 2 channel PRO receiver and 2 A4 pages for the Prosat Scanning receiver is poor documentation isn't it? Another

question was raised by the data connector which I temporarily discarded, avoiding digital signals getting to the aerial. What's its use? How is it connected to what?
For a reason that no one can understand the third page from the instructions of the PROscan receiver was missing from most early sales. The third page fully describes the Data interface. However the user will need some sound electronic experience and a CMOS data book.

In general, I found the Timestep products of superior quality, compared to the price; the manuals on the contrary, I am sorry to say, are nothing less than poor. I would certainly appreciate articles about enhancements or explanations of the Timestep products in the RIG journal.
Timestep would welcome a regular feature in the Journal. An INFO item on PROsatII is included elsewhere in this issue.

In a firm or factory, a suggestions box has never done any harm. Look at all the upgrades on Compuserve for the Kenwood and ICOM (and other) commercial equipment.
Most software upgrades are as a direct result from users comments. Users can expect additional features by way of updates, which are usually free of charge.

Fred Pieters, Kleine Heide 22, B-9830, St.-Martens-Latem, Belgium
Tel: 32-91-82.88.42 Compuserve 100016,512

Dear Editor,

I have been meaning to write for a long time; firstly to thank committee members and newsletter authors for their advice, help, and guidance over the last six years. RIG hardware has proved outstanding and software from authors like Les Hamilton with his Archimedes !SatProg and !Predict programs have been invaluable. Secondly I have been wanting to seek advice on the role of remote imaging in secondary education and to comment briefly on weather satellite receiving stations in schools.

As a geography teacher in a secondary school and a radio amateur, I found that an interest in remote imaging developed as a (fairly!) natural progression. After some years of frustration with kits (probably a result of my incompetent assembly work!), I discovered the RIG Dartcom scanning receiver module and downconverter. With some more construction work on a RIG 1.0 metre dish and feedhorn, a successful and reliable system was

obtained. This has now been running 24 hours a day for 3 years with excellent results.

If you are involved with the Geography National Curriculum, you will know that there are many resource problems in its delivery within schools. Satellite imagery, particularly if the 'real-time' variety is attempted, must come high on a ranked difficulty list. Many schools have obtained computer based systems, often provided by education initiative (TVEI) sourced finances, parental support or careful saving and budgeting with departmental funds. Several difficulties then often present themselves. The first is getting the whole system functioning. The main hurdles tend to be either computer handling or understanding of receiver hardware. After success here (if it is achieved!), the next problem is keeping the system running. Receiver or downconverter drift, weathering of aerial and/or pre-amp connections or aerial instability in high winds can be to blame. The third problem concerns the academic application of the resource. Those rolling cloud sequences across Europe and global hemispheres are certainly most impressive when you first deliver them to the classroom, but to incorporate them into effective teaching, to classes of over thirty in some cases, is a very different task.

With the use of D2, DTOT & CTOT animated sequences from different times of the year, a remarkable amount of meteorology can be demonstrated. I have found it best to store clear example sequences to illustrate different conditions, such as: prevailing winds, relief effects on cloud formation, convectional and frontal cloud formation, land/sea temperature differentials in summer and winter (maritime and continental climates), depression development and movement, jet streams, seasonal variations in the inter-tropical convergence zone, earth rotation (apparent movement of the sun), desert/savanna climates, variations in albedo, instability of polar air masses, anticyclones/stable weather, tropical storms (LY series - hurricane Andrew is certainly the most spectacular sequence I have on the hard disc) etc.

With the current D2 sequence and the daily weather map alongside to help interpretation, one has a potent resource to assist meteorology teaching from Year 7 to 13 (that's a secondary school first year to upper sixth if you don't understand national curriculum-speak or 11-18 real years!). I have been meaning to develop a series of work sheets to accompany these resources but have still some way to go on these. Has anyone else made progress here? I'm sure there are many teachers amongst us who could provide ideas.

I have had several cries for help locally to assist with weather satellite receiving problems and there is no doubt that many interested school staff do not have the time or expertise to get the very best out of their remote imaging resource. Perhaps you could help a local school?

I use an Archimedes based system with Spacetech card and software - recently upgraded to Weather Desk. Archimedes computers are certainly one of the most common machines in secondary schools today and combined with the Spacetech decoding card and software, the combination represents an outstanding school satellite receiving station. Many schools have them, so the initial expense for the computer and the operators learning curve may have been met already.

CDROMs are also becoming common-place in schools. If you also have Archimedes computers in your school, do invest in Spacetech's PDSView and CDs from the Voyager solar system mission. They market CDs with a superb selection of NASA, LANDSAT and other satellite missions, including radar, relief and ocean images (the latter can be animated as a global sequence of sea surface temperatures). Please write in if you have any ideas on remote imaging in schools - or ring either John Tellick or myself.

Tom Walter (G4KWL), 19 Sycamore Road, Reading, RG1 5LW
[Ed: Please note that Tom Walter has agreed to act as Archimedes adviser in our RIG help lines.]

As promised, a letter from a Rig member writing from Inner Mongolia!

Dear James,

I bet you don't get too many letters from RIG members in Inner Mongolia, so I thought I would update you on the weather satellite scene here in one of the remoter regions of China. (Writing helps to keep my fingers warm in the sub-zero temperatures here)!

The Chinese word for satellite is 'WEI XING' which means 'patrolling star', and the Chinese word for weather is 'TIAN QI' which means 'The condition of heaven'. Old Chinese characters are read from right to left (which probably accounts for the reverse polarisation on Chinese satellites)! Of course nobody has heard of weather satellites here. I tried to buy a 12 volt zener diode here the other day, and ended up with some Ginger Roots! (Which they tell me are just as good for you).

I am carrying with me copies of RIG28, 29 and 30, and everyone is amazed by the pictures. I also have a full picture of the earth I took from METEOSAT 5 before I left England in September (I'm told other people carry pictures of their wife and kids!)

'Feng Yun' (The name of the Chinese weather satellites) means 'The circles produced around the moon by the winds on a stormy night' - No wonder Les Currington has been getting some strange images from Feng Yun.

I've bought a Wok which looks vaguely parabolic, so look out for my article in RIG next year on 'Chinese dishes costing less than two quid!' *[Ed: You can also get quite a nice prawn fried rice here for less than two quid!].* When I explained to my Chinese friends what I was going to use it for they seemed disappointed that it wouldn't get CNN.

I now visit China two or three times every year on business, and I'd be delighted to follow up on any contact addresses which Les or Peter may have.

Best Wishes,

Keith Holland, ZHAO JUN HOTEL, HUHEHOT, Inner Mongolia, China.
P.S. My home address in London is 40 Brookland Rise, London NW11 6DS

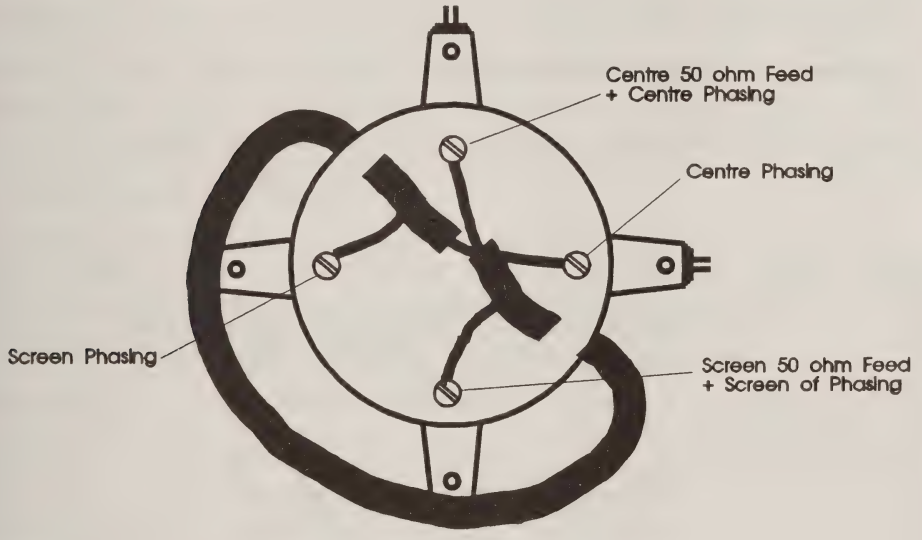
Dear Henry,

First, may I say that after just over a year as a member of RIG, I still look forward eagerly to the RIG Newsletter. Obviously a lot of hard work goes into the preparation and I have never ceased to be impressed by the quality of articles, both in content and in style. I regularly purchase some of the 'Ham' magazines and am astonished by the poor quality of prose and appalling grammar they regularly purvey - a minor point, no doubt - but by contrast, RIG arrives like a breath of Spring. Articles, such as those by Roger Belcher, are outstanding - and a real treat to read. So keep up the good work. I would like to see the term 'RIG Newsletter' retained, as it is pleasantly understated and very much retains the flavour of the publication.

Dr.Robert Ginsburg, FFARCS, Golders Green, London.

[Glad you enjoy the publication, but due to an overwhelming demand we have renamed it 'Journal'. Mike]

Dear James,
Being relatively new to w/sat rx I found it difficult to relate actual pass times with those printed in RIG 30, then like a bolt from the blue! There it was! you had 31 days in October and 30 days in November!, *[Ed: That's confused us as well! We thought there were 31 days in October and 30 in November - however checking in RIG 30 did show that we'd actually reversed the month lengths! Congratulations on spotting the error!]* which by December seems to have evened each other out, but put me out by about 20 mins a pass!! But when I did hit on the correct time for a pass, even more problems, bits of pictures, no pictures, promising starts, then nothing. As a last resort I decided to change over the phasing harness connections and problems solved! I made up my aerial with drawing as below from manufacturer.



Alan Wilkins, Peverell, Plymouth.

FOR SALE...

Dartcom Down convertor recently fitted with crystals for NOAA HRPT reception. Pair of spare crystals for METEOSAT APT also included. £120
YU3 Frame Store in low profile case. Included 4 page mod and Dartcom A-D board. Good working order. £210
Maplin Satellite receiver, cased and in good working order. £40
Phillips 12" green screen monitor. Suitable for use with frame store etc. £50
PC-SAT3 system....card/software £40
Phone Trevor after 6.p.m. on 0225 703726

BULLETIN BOARDS:

There are now operating, 24 hours a day, two Bulletin Boards that you can use to download Keplers and get other information regarding latest developments in the Weather Sat scene; such as which Russian satellites are currently operating, etc.

The RIG BBS also has Shareware, etc. which can be downloaded. You can also leave messages on both the BBS for the operators. There is no charge for these services, just the cost of your telephone call.

The Keplers are updated every week and are in Amsat and 2-line format.

The RIG BBS is on 0945 85666.

The Timestep BBS is on 0440 820002.

The protocol is the normal standard, 8 bit, no parity, 1 stop bit.

A quarterly publication for hardware, software and applications of WEFAX, APT, VAS, HRPT and GOESTAP.

WeatherSat Ink

The Environmental
Satellite Applications Journal

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$15 US per year $20 all others, US funds
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RIG AT RALLIES

For those members who are not Radio Amateurs, a brief explanation of the term "Rally". These are events normally organised by local Radio Amateur clubs and societies, and are held in Schools, Halls, or just outside town in Marquees in local fields. There is normally parking space provided and a small entrance fee is charged. They consist of trestle tables containing new and used equipment and components, from traders in the electronics and computer field, often at knock down prices. (Many resemble the familiar Car Boot Sale.) There are also displays and demonstrations by radio related societies and organisations (such as RIG). They normally start at 10.00 or 10.30am and fizzle out at around 4.00pm. They are normally signposted from the town in question by small signs attached to roadsigns, etc. reading "Radio Rally", "Rally", or the initials of the society, such as "ERAS", etc. If all else fails, look for a stream of cars sprouting aerials on their roofs, and follow them. Below is a list of Rallies that we hope to attend this year; and we will be pleased to see you.

IMPORTANT... If you visit a Rally in order to purchase RIG goods please give Henry a ring a couple of days before, so that he can put them on one side for you, as only small quantities are normally taken.

March 6	(RIG AGM) Sandown Racecourse, Esher, Surrey
March 13	Picketts Lock, Demonton, North London (off M25).
May 2	BATC, Harlaxton Manor, Lincolnshire, grounds of house.
May 16	NEC Birmingham Exhibition Centre
June 6	Springfields, Spalding, Lincolnshire.
June 13	Elvaston Castle, Derbyshire.
June 27	Longleat, in grounds of Wildlife park.
July 4	York, Racecourse
August 18	Woburn Abbey, Bedfordshire, in the grounds.
September 12	Lincoln, Showground
September	BARTG, Sandown Racecourse, Esher, Surrey
September 19	Peterborough, East of England Showground
October	Leicester, in the Granby Halls (2 days)

We are always pleased to see volunteer members at these rallies, especially those who live local to the event, who can help out on the RIG stand for a short while, and give the regulars a break during the day.

RIG HELPLINES

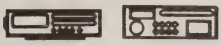
General Enquiries Meteosat information NOAA information Supplier Complaints A copy of the Group Rules can also be obtained from John Tellick		John Tellick	081 390 3315
Russian, Chinese satellite information/status		Peter Wakelin	0344 23200
Schools Education Co-ordinator		John Tellick	081 390 3315
Schools/	John Murray	Torquay	0803 217754
Educational Enquiries	Frank Bell	Godalming	0483 416897
	Tom Walter	Reading	0734 871330
	Bob Coombes	Haslemere	0428 642930
	John Din	Bristol	0454 773387
	Alan Wright	Norwich	0603 713449
Framestore Technical Support	Mike Coombs (7.30pm-9.30pm)		0530 243494

RIG MICRO SPECIALISTS:

PC and Printer Problems	Mark Pepper (office hours)	0494 471111 (Ext.2133)
BBC Micro	Enquire via John Tellick	081 390 3315
Commodore Amiga	Chris Pretty	0420 82752
Archimedes	Tom Walter	0734 871330
PCSAT3/PROSATII/PDUS	James Brown	0656 782632
HRPT	Peter Wakelin	0344 23200
PDUS	James Brown (Not available on Sundays)	0656 782632

NOTE: We are very grateful to the above members for offering their services to the Helpline. Please do not abuse the service by ringing them for queries other than those listed against their names.

RIG SHOP CORNER



*** ALL PRODUCTS FOR SALE TO RIG MEMBERS ONLY ***
*** FOR THEIR OWN PERSONAL USE ***
*** NOT FOR SELLING-ON ***

All prices shown include post and packing except where marked

Receiving Equipment	UK/EC Price	Overseas Price
RIG DARTCOM Meteosat Downconverter. Assembled and tested module in tin plate box	£148.00	£126.00
Complete, assembled and mounted in weather-proof box.	£185.00	£158.00
RIG DARTCOM VHF Scanning Receiver. Assembled and tested module, with LED channel number display.	£130.00	£110.00
As above, but with LCD frequency read-out instead of LED channel number display.	£171.00	£145.00
Both the above items are modules and require a box, together with several components, switches, etc.		
RIG TIMESTEP PROscan Receiver.	£191.00	£163.00
See main advertisement.	*Special Rally Price*	*£185.00*
RIG VHF Preamp. Includes a bandpass filter and is ideal for mast-head mounting. Assembled and tested module, only needs boxing.	£17.00	£15.00
RIG TIMESTEP VHF Preamp Built and tested, in diecast box, 12vdc coax-fed	£24.00	£20.00
RIG 1695MHz Low Noise Amplifier kit. *Experienced constructors only.*	£29.00	£25.00

Computer Software/Hardware

RIG TIMESTEP PCwSAT III, IBM/PC Comp. System.	£ 54.00	£ 45.00
See main advertisement.	*Special Rally Price*	*£ 49.95*
RIG TIMESTEP PROsat II, IBM/PC Comp. System.	£124.00	£105.00
See main advertisement.	*Special Rally Price*	*£120.00*

Antenna systems

RIG CROSSED DIPOLES A Turnstile type design, in kit form *(available in UK only)* incl. P&P	£26.00	
(Note: Price rise on March 1st, details in RIG32.)	*Special Rally Price*	*£20.00*

DISHES *(Available in UK only - Prices do NOT include P&P, see below)*

1.2 Metre (dish only), used condition	£20.00
1.6 Metre (dish only), used condition	£25.00

Dish Feeds - Enquire availability from the Chairman.

The above dish prices are for collection from the Chairman, or by prior arrangement at Rallies or Exhibitions.

RIG Binders

Available by post from Gordon Fleming, 168 Bythway, Welwyn Garden City, Herts. AL8 1DU. UK Price £4.00 each, EC/European Price £4.50, Outside Europe Price £5.00. Cheques to *"REMOTE IMAGING GROUP"* please.

Back Issues of RIG Newsletters

	Rally Price	UK Price	EC/Europe Price	Outside Europe Price
RIG 8-11 1987	£4.00	£5.00	£6.00	£7.00
RIG 12-15 1988	£4.00	£5.00	£6.00	£7.00
RIG 16-19 1989	£4.00	£5.00	£6.00	£7.00
RIG 20-23 1990	£5.00	£6.00	£7.00	£8.00
RIG 24-27 1991	£5.00	£6.00	£7.00	£8.00
RIG 28-31 1992	£5.00	£6.00	£7.00	£8.00

Note: Prices quoted are for a set of four, including Post and Packing.

RIG 1-7 are currently out of print. Individual issues are no longer available (hardship cases excepted).

Ordering Information

All items are available from the Chairman, Henry Neale (except where marked) and include return by UK 1st class mail (except dishes and Newsletters). Euro overseas sent via Airmail printed paper rate.

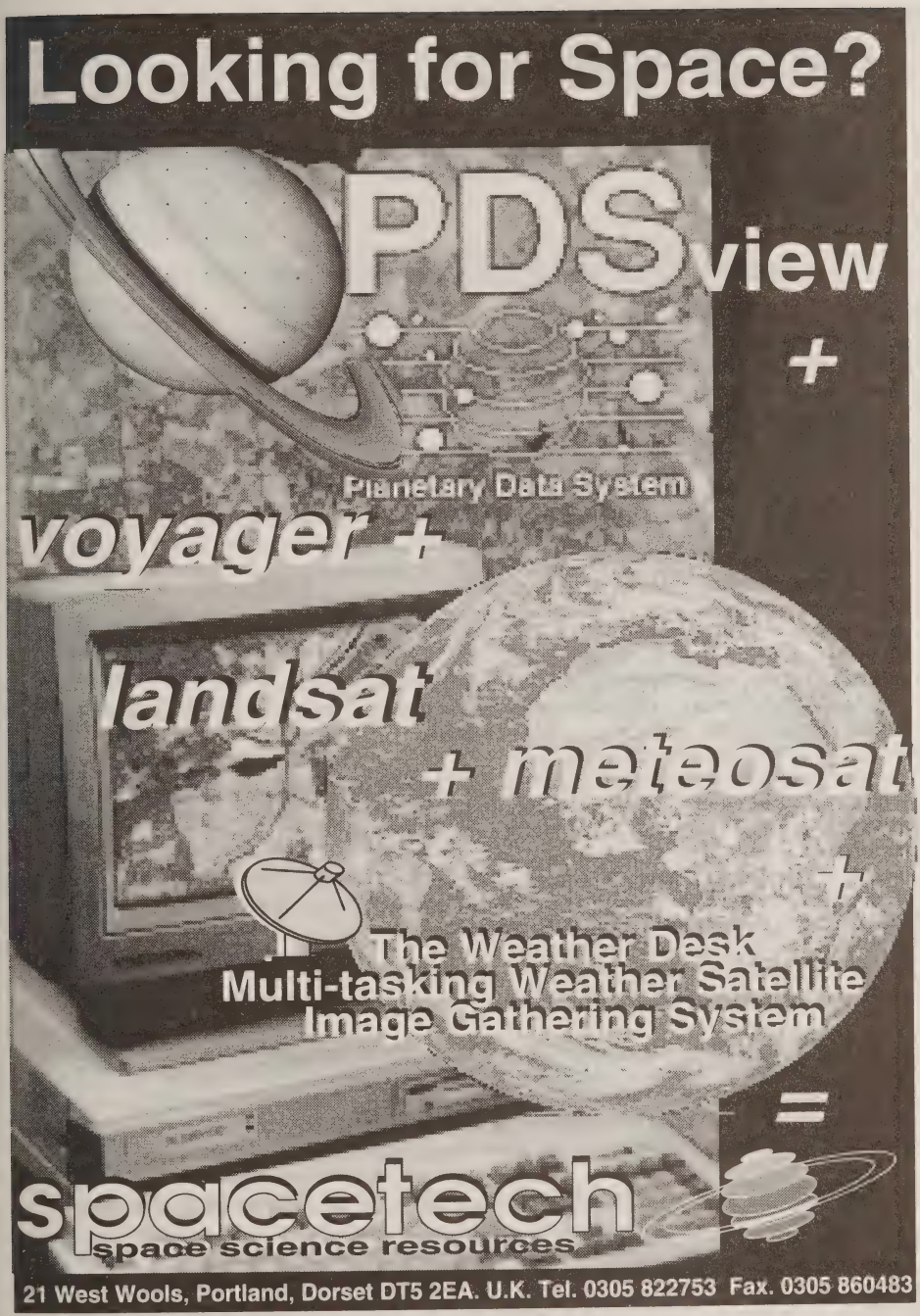
UK VAT is now applicable on sales to the following EC countries - France, Germany, Belgium, Portugal, Spain, Republic of Ireland, Denmark, Italy, Luxembourg, Netherlands, United Kingdom (including Isle of Man). Members in these countries should use UK/EC price when ordering. EC members who are registered for VAT must forward their VAT registration No. to the Treasurer to enable them to receive VAT exempt goods.

As UK/EC prices now include VAT where applicable; receipts will be issued upon request. Remote Imaging Group VAT Registration No. 594 7483 83.
Channel Isles: divide by 1.175 to remove VAT content.

UK members, By Cheque or Postal Order. **Overseas members,** Pay by Bank Draft (drawn on a UK London-based bank) or Eurocheque(s). (Payments to a Maximum of £100.00 in any one Eurocheque). No local currency please.
All cheques made payable to *"REMOTE IMAGING GROUP"*.

* *

Credit Cards Accepted (Access/Visa/Mastercard/Eurocard) Add 3% to Total.
Available by MAILORDER only from the Treasurer, Mark Clarke, 9 Park Lane, Bulmer Tye, Sudbury, Suffolk, CO10 7EQ.
Please state type of card, Card No., Expiry Date.
All Credit Cards authorised before goods are despatched.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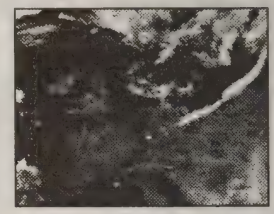


TH2SAT PC Weather Satellite Decoder - £100 + £5 P&P

TH2SAT is a software and hardware package that will allow the display of APT signals on an IBM Personal Computer (or compatible). The PC half card contains a single phono input socket, decodes APT signals to 256 levels (using an 8-bit A/D converter) and samples at 4800Hz (in 1024x768 pixel video mode, each pixel is a discrete sampled value, i.e. no scaling up from a lower resolution - ideal for zooming). The input signal level is controlled directly from the keyboard (no knobs to set up or adjust). TH2SAT supports VGA or Super VGA graphics (most Super VGA colour cards are supported - TH2 Imaging strongly recommend Super VGA).

- 3 Video modes supported 320x200 640x480 1024x768 - all modes 256 colours
- Synchronises to METEOSAT, NOAA and METEOR
- Synchronises to METEOSAT start tone
- Aspect ratio correction selected from keyboard
- Colour images with dynamic range controls and multiple palettes
- Specific infra-red image palettes
- Zooms images to any level of magnification
- Built-in signal level controller from keyboard - no hardware set up
- Independent signal level control for each satellite mode, e.g. infra red and visible light
- Built-in software brightness controller from keyboard
- Picture show facility (up to 255 image files)
- 3-dimensional projection with two linearity modes and three intensities
- High-pass (three intensities), low-pass and median filtering
- Instantaneous Contrast equalisation enhancement and contrast stretching
- Histogram frequency graph, image negation and inversion
- Unattended operation of up to 99 passes or METEOSAT frames
- Unattended operation time plans can be saved and reused, e.g. METEOSAT C02
- Saves pictures in compressed format (average 30% saving)
- PCX image translator program included
- Simple menu-driven system - no mouse required
- TH2SAT is a single, self-contained program - all features work with all satellite images

TH2SAT Demonstration Disc - £3.50 including P&P

A demonstration disc with sample pictures containing the full TH2SAT system (excluding image reception capability) - not just a picture show. When ordering please state disc size (3½" or 5¼"), disc density and video card (VGA or ½ / 1 Megabyte Super VGA).

METEOSAT Loop Yagis - from £55 + £6 P&P or £12 Courier Delivery

TH2 Imaging supply 37 element loop Yagis (complete with "N" type connector) for METEOSAT reception. They are provided as an easy-to-assemble kit. Yagis with more than 37 elements are available on request.

TH2 Imaging operates on the basis of the price you see is the price you pay. There are no **hidden extras** or **additional charges**. These prices apply to RIG members only. Postage rates apply to UK.

PROLOGUE COMPUTERS LTD

2 ORCHARD RISE, OLVESTON, BRISTOL BS12 3DY
TEL. 0454 612882 FAX 0454 618885

□ COMPUTERS

Professional quality Computers at discount prices. Ideally suited for use with Weather satellite systems, at display resolutions up to 1024 x 768 Pixels With Super VGA monitor.

386sx 33MHz. 16Kb Cache, 2Mb RAM (expandable to 16Mb) Sony 1.44Mb Floppy drive.
Small footprint high quality metal case, 200W PSU. 4 Free Expansion slots.
14" SVGA Colour monitor (0.28 d.p.), T.L. ET4000 1Mb (1024x768x256) VGA Card.
40Mb 18ms Hard Disk, AMI Bios, Mouse. £660.00

486SX-25MHz. 64Kb Cache, 4Mb RAM (expandable to 32Mb). Sony 1.44Mb drive.
Small footprint high quality metal case, 200W PSU. 4 Free expansion slots.
14" SVGA Colour monitor (0.28 d.p.), T.L. ET4000 1Mb (1024x768x256) VGA Card.
40Mb 18ms Hard Disk, AMI Bios, Mouse. £810.00

486DX-33MHz 64Kb Cache, 4Mb RAM (expandable to 32Mb). Sony 1.44Mb drive.
Small footprint or full AT case, 200W PSU. 4/5 Free expansion slots.
14" SVGA colour monitor (0.28 d.p.), T.L. ET4000 1Mb (1024x768x256) VGA Card.
40Mb 18ms Hard Disk, AMI Bios, Mouse. £950.00

□ OPTIONS:

14" Super VGA Monitor (Low Rad. N.I) .....ADD £62
Memory Upgrade per Mb.....ADD £27.75
Genoa 7900 ET4000 1Mb VGA Card .....ADD £49
Mini Tower Case (Leaves 5 free expansion slots) ADD £10
102Mb 15ms Hard Disk..... ADD £85
125Mb 15ms Hard Disk.....ADD £20
MS DOS v5.0.....ADD £49

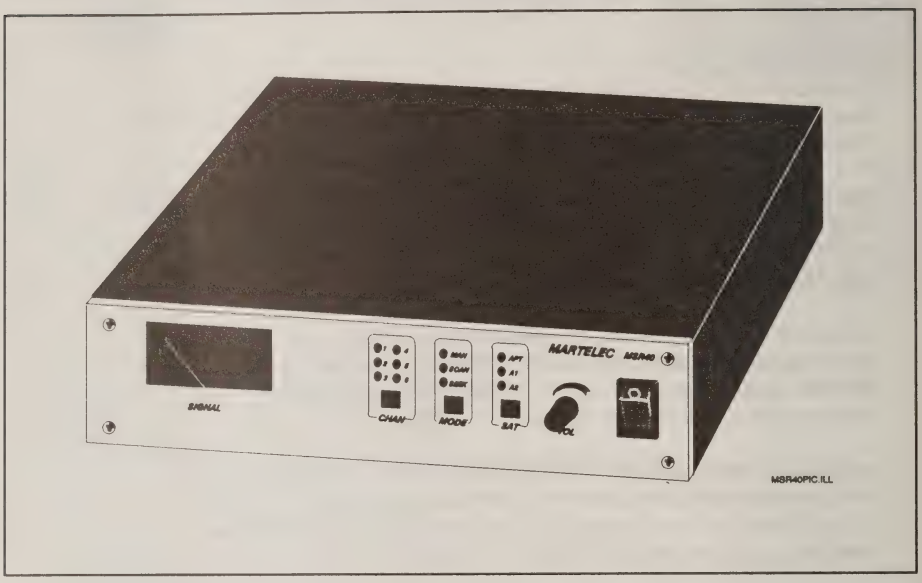
□ COMPONENTS:

MOTHERBOARDS : 386SX-33 /16Kb £117, 486SX-25 /64Kb £209, 486DX-33 /64Kb £379.
VGA CARDS : Genoa 7900 ET4000 24bit 1Mb (1024x768x256 colours) £129
Trident 1Mb (1024x768x256 colours) £49
T.L. ET4000 1Mb (1024x768x256 colours) £79
MONITORS : 14" VGA Mono £79, 14" VGA colour £185
14" Super VGA (0.28mm) £209, 14" SVGA (0.28mm NI LR) Colour £268
FLOPPY DRIVES : SONY 1.44Mb £32, 1.2Mb £39.50
HARD DISKS : IBM 40Mb £113, 102Mb 15ms £189, 125Mb 15ms £209.

Please call for latest pricing on systems and components (Day/Evening)
All prices EXCLUDE VAT & Carriage. Delivery 5 to 10 Days

MSR40 Synthesized Satellite Receiver

.....When quality counts



The result of 12 month's intensive R & D, and rigorous testing, the all new MSR40 is a truly outstanding performer. Designed in accordance with the principles set out in Roger Belcher's authoritative article (RIG27), and fully conforming with his specifications for the highest possible level of interference rejection, this receiver is the measure by which others will be judged.

Housed in a custom-designed aluminium enclosure, the MSR40 is both attractive and rugged. Inside, its rigorously designed and tested circuitry ensures that you have the highest performance currently available. If you would like to know more about the MSR40, please call or write.

Features:

- *Extremely high interference rejection capability (Rejection of > + 13dBm at 200KHz offset)*
- *Fully synthesized*
- *Attractive, compact design*
- *Remote control facility*
- *Mains or DC power*
- *Separate inputs for Meteosat and VHF inputs*
- *Meteosat downconverter power via coax feed*
- *Signal level meter*
- *Intelligent Search and Scan modes*
- *Signal Level Output on rear panel*
- *Constant output level when switching APT/WEFAX*

The MSR40 is sold on a money-back guarantee basis.

Price £295
(excl. VAT & carriage)

martelec *communication systems*

The Acorns, Wyck Lane, East Worldham, Alton, Hampshire, GU34 3AW, U.K. Tel/Fax 0420 82752

OMNIPRO 5.2

The Combined Weather Sat and Facsimile package for PCs

Provides up to 1024 x 768 x 256 screen resolution!

Both! In one package, Omnipro gives you the software and interface card for both facsimile and wxsat reception. This latest version of Omnipro has even more features and improvements and represents superb value - especially if your interests span both weather satellite and facsimile reception. The package contains a comprehensive interface card for the demodulation of all satellite and facsimile modes. In addition, the interface contains all the necessary hardware for the optional SSTV and CW/RTTY/ASCII packages.

Separate inputs are provided for fax and wxsat, enabling the permanent connection to their respective receivers. Omnipro runs on any AT machine (286, 386, 486) and some faster XTs (10MHz and faster).

Facsimile Reception

Probably the most comprehensive system ever offered for the reception of facsimile transmissions - decoding all standards found on VLF, through to UHF, including amateur fax, press fax (Incl. colour), meteorological charts etc. The package provides automatic scrolling, and caters for IOCs of 144, 264, 267, 353, and 576 and drum speeds of 60, 90, 120, 180, and 240rpm. There is software shift selection to allow for 1900+400Hz or 1900+150Hz signals. The drumspeed reference is quartz stabilized for accurate and stable image framing, and the images may be scanned in any of four directions.

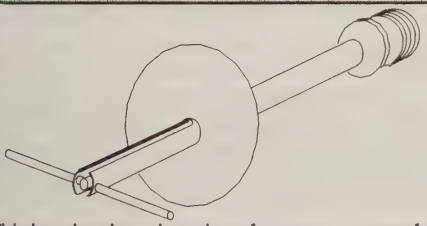
Weather Satellite Imaging

Decodes Meteosat, NOAA, Meteor, Okean, Cosmos etc. with all sync tones detected. Images are decoded and stored in full 8-bit resolution and displayed in either EGA, VGA, SVGA, or EVGA formats with excellent clarity and definition. Omnipro features fully automatic reception capability, programmable timer, 3D presentation, multi-sequence animation, and superb printer dumps for laser and dot matrix printers.

Price £195.00

(Price excludes carriage at £4, and VAT)

MSF30 1.7GHz Feed Assembly

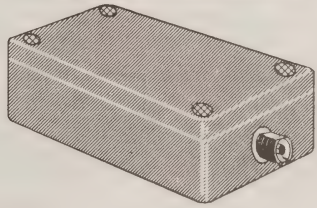


This is a developed version of our very successful MSF20 dipole feed, which, as a result of network analyser appraisal has been further refined. The new MSF30 has a high Q, and is now adjustable for focal distance and polarization angle, enabling optimum performance to be realized with any dish. Supplied complete with integral N-type socket and mounting plate.

Still £39.50

(excl. VAT & carriage)

MSC30 Low Noise Downconverter



A very low noise downconverter providing both channels A1 and A2, with on-board temperature stabilization, and a choice of powering either via the feed cable or a separate connector. Housed in a high-quality IP65 diecast box. Complete with cable and connectors.

£170

(excl. VAT & carriage)

martelec *communication systems*

The Acorns, Wyck Lane, East Worldham, Alton, Hampshire, GU34 3AW, U.K. Tel/Fax 0420 82752

RIG - Microwave Modules PCwSAT III

The first of a new line of low cost Amateur Weather Satellite products from Microwave Modules. It is fully compatible with the RIG PCsat III.

This is a low cost solution to Weather Satellite Imaging on PC type computers. Although extremely cost effective it handles all known APT satellites. It supports all known VGA video cards in all modes. It will automatically animate up to 100 frames and its variants are in use by over 1,000 people throughout the World !

Satellites

We cover all known satellites: NOAA, Meteor asynchronous, Meteor synchronous, Okean asynchronous, Okean synchronous, Feng Yun, Meteosat and GOES. Most importantly there is no Doppler bending of the edges of the image, even from tape ! We deliberately do not use crystal control for the Soviet series as this produces bad doppler bending and no signals at all from tape. Quite simply the handling of Polar satellites is superb ! It is possible to receive GOES (just) in the UK, the transmission standard is slightly different, this is why we do not compromise and have a special setting for GOES.

Animation

Animation is crucially important to satellite enthusiasts. Some systems allow you to animate AFTER the images have been received. We call our system "Stand Alone Animation"; you simply set the computer and walk away. Each image is automatically received and animated. Without touching the computer at all, every time you walk past you will see the latest sequence of frames automatically animating ! Animation is smooth, fills the whole screen and is completely flicker free. You only need 640K of memory as the storage is on your hard disc. Animation is standard, not an option.

Video Cards

We support ALL video cards in ALL modes. Depending on the card used it is sometimes necessary to view the image in different modes after reception. Although we fully support 1024 x 768 x 256 this really needs a 20" monitor to do justice. With 14" monitors the pixel size is less than the shadow mask aperture, so you end up losing data. By far the best mode is 800 x 600 x 256, this gives an non-interlaced flicker free display.

Computer requirements

You can use ANY VGA card in ANY mode, it will work on an XT but a 286 or better will give the best results. A hard drive is recommended. MS DOS is preferred and all features are available on a 640K memory machine. Discs are high density format.

Due to the low marketing costs of Microwave Modules selling through RIG, the price for RIG beginners is just

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Henry Neale RIG Chairman
Thornlea Fishergate Sutton St James
Spalding Lincs PE12 0EZ Tel. 0945 85353

RIG - Timestep PROsat II

This system provides the look and feel of Windows 3.1, image processing, 3D, NOAA Gridding, NOAA temperature calibration and full data from NOAA and the Soviet series in a huge 2.4MB file. Reception of ANY satellite can be in ANY VGA mode !

Satellites

We cover all known satellites: NOAA, Meteor asynchronous, Meteor synchronous, Okean asynchronous, Okean synchronous, Feng Yun, Meteosat and GOES. Most importantly there is no Doppler bending of the edges of the image, even from tape ! We deliberately do not use crystal control for the Soviet series as this produces bad doppler bending and no signals at all from tape. Quite simply the handling of Polar satellites is superb ! It is possible to receive GOES (just) in the UK, the transmission is slightly different, this is why we do not compromise and have a special setting for GOES.

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NOAA Gridding and Temperature and Resolution

If you are not sure why these features are important we suggest you read the review in RIG 26 by Rev James Brown. Quite simply you can point to a spot on the image and read its temperature directly, no ground truth data required ! The Gridding will overlay the image with latitude and longitude lines. The mouse is interactive and will give spot lat and long. Combined with temperature, it is possible to simultaneously read latitude, longitude and temperature. This incredible program will store ALL of the data received during a polar pass, both visible AND infrared in FULL resolution. Any area of either sensor can be analyzed in full resolution; you do not have to decide before the image what you want to see.

Features

A built in dithered Laser Dump gives results of outstanding quality, all 32 grey scales are clearly visible from the Meteosat Test Card and the tiny writing is readable ! Histogram equalisation is incorporated to quickly contrast stretch dark or light images. Transects between any two points can be drawn. A median filter removes outlines from Meteosat for 3D projection and remarkably removes spot noise from noisy satellites.

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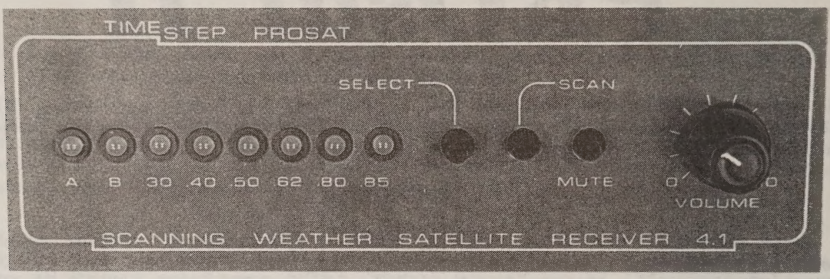
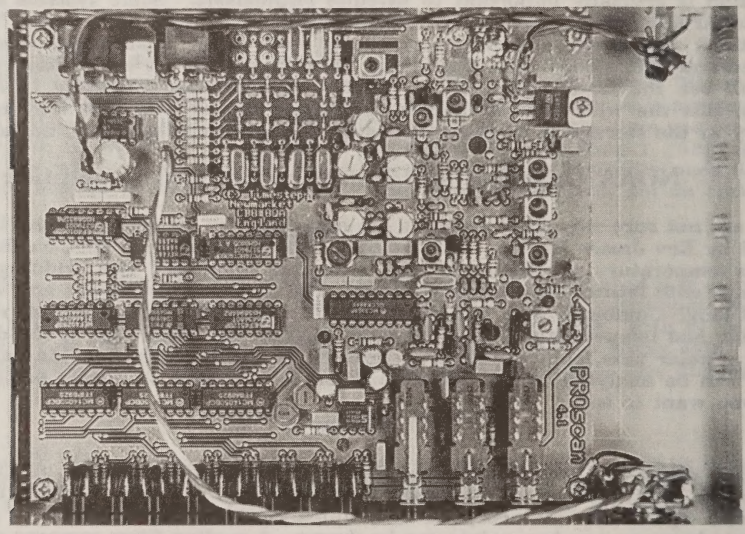
A demonstration disc & colour brochure are available for £3.00

Henry Neale RIG Chairman
Thornlea Fishergate Sutton St James
Spalding Lincs PE12 0EZ Tel. 0945 85353

RIG - Timestep PROscan Polar Receiver



What do you want from a Scanning Weather Satellite Receiver ? a) Intelligent squelch that only responds to weather satellites and is quiet when no satellite is present b) To be able to read the frequency directly from the front panel when it stops on a satellite c) To be able to "lock out" unwanted satellites d) resistant to pager interference up to the pager transmitter itself (where of course the field strength is low e) resistant to pager interference at 1 to 2 miles where the field strength is at a maximum f) an unconditional money back guarantee g) A VAT inclusive price Only the RIG-Timestep receiver offers all this !



The PROscan receiver uses a lot of filtering, 3 coils in the pre-amp (optional), 4 coils in the RF amp (total 7 coils at RF), 3 coils in the oscillator, 1 matching coil at first IF, 5 ceramic filters at first IF, 5 coils at second IF (total 11 IF filters) and a quadrature discriminator for linearity and high ultimate signal to noise. A preamplifier is not required for short cable runs but adds extra selectivity and makes up for feeder loss on longer runs.

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Henry Neale RIG Chairman
Thornlea Fishergate Sutton St James
Spalding Lincs PE12 0EZ Tel. 0945 85353

Timestep HRPT

Noise free digital HRPT transmissions from NOAA, with a ground resolution of just 1.1K allow images to be received in incredible clarity. Rivers, lakes, mountains, cities and even small towns can be seen on good days.

Image Processing including variable and histogram contrast equalisation combined with full colour editing give superb results from any image. Colour enhancement allows sea surface temperature and land details to stand out in high contrast. The sophisticated mouse driven software allows all 5 bands to be saved in full 10 bit data and displayed on nearly all VGA and SVGA cards right up to 1024 pixels, 768 lines and 256 colours.

Zoom to greater than pixel level is available from both a mouse driven zoom box or using a roaming zoom that allows real time dynamic panning. Latitude and Longitude griding combined with a mouse pointer readout of temperature. The image below was received using the HRPT system and 3 bands combined using Multi Spectral View II.

We are offering the complete receiver and PC card, a low noise preamplifier, cable. You will need a 0.9M dish (and a way of moving it), and a 286 or better computer with SVGA and a hard drive.

Timestep Wickhambrook Newmarket CB8 8QA England
Tel. 0440 820040 Fax. 0440 820281

Timestep PDUS

At last Meteosat Primary Data is available to the amateur. We believe that this is another World First for Timestep ! With the help of Dr John DuBois and Ed Murashie we have at a stroke brought low cost digital imagery in to RIG members homes.

NOAA, generally acknowledged as the best in imaging, has 4KM resolution on its APT transmission and is very infrequent. PDUS by contrast resolves 2.5KM at the sub satellite point AND transmits the whole of Europe every 30 minutes. The whole Earth Disc is transmitted at lower resolution every hour. Imagine looking at the River Nile in 2.5KM resolution, the Aswan Dam is clearly visible as the deeper water shows as a much cooler temperature. Remember this is 2.5KM resolution, NOAA APT is 4KM and simply won't show the Nile anyway ! Look at the Amazon, the River Niger, the Volta rivers, Lake Volta, Rain Forests and much, much more ! The image below is false coloured using the standard built in colour !

We are offering the complete receiver and PC card, a 1.6M dish, a low noise preamplifier and cable You will need a 286 or better computer with SVGA and a hard drive.

Timestep Wickhambrook Newmarket CB8 8QA England
Tel. 0440 820040 Fax. 0440 820281